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1954

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TARGET FOR THE JET AGE

The jet-powered target you see here is the Ryan Firebee.

It's half the size of a jet fighter, and is used to simulate jet plane maneuvers in training anti-aircraft gunners and interceptor pilots.

After a run the pilotless drone is lowered by parachute—to be in condition to fly another day. The Firebee is a joint development of the Air Force, Army and Navy.

An important reason behind the drone's success is her autopilot. Made up of components of the famous Honeywell E-6, the Firebee's special autopilot flies her at the command of a radio operator who's often far out of sight on the ground.

New uses are continually being found for the various Honeywell autopilots and their components that have been proven by many millions of air miles. They're backed by experience gained in manufacturing more autopilots than any other company in the world. Autopilots are an important item in our complete line of controls for everything that flies. This line will continue to expand because automatic control is important to aviation's progress. And *automatic control* is Honeywell's business.

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Aeronautical Controls

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Airpower fares well in Eisenhower budget. Boiled down, here's what it means:

$9.1 billion would be spent by Air Force and Navy on new planes and related equipment in fiscal 1955, starting next July 1. They're spending $9.3 billion this year. Army will spend $60 million, up from $50 million.

$4.8 billion in new plane money—for future use—is asked by AF and Navy, against $4.9 billion they received this year. AF also carries over $2 billion, making total of $6.8 billion. Army doesn't get any new money, but small part of $4.7 billion carryover will be used for aviation.

Active aircraft inventory of AF will reach 21,000 next July, increase to 22,900 a year later. Navy will have 13,130 by July, 12,940 the following year. Navy planes in active operation, however, will remain at 9941 at end of both years.

•

Manufacturers will watch closely to see what type of legislation is proposed to back up President's tax revision recommendations in budget.

Changes were urged in depreciation allowances, research and development expenses, accumulation of earnings, loss carrybacks. Effect could be very important, depending on how legislation is worded.

•

Further layoffs at CAA should be few if $96,450,000 budget request for salaries and other expenses isn't cut too much in Congress.

Although amount sought is lowest since 1950, earlier signs of another big layoff aren't apparent now. CAA trimmed salaries and expenses $9.4 million last December, laid off 656 employes.

Estimate now is that no more than 30-50 jobs will be dropped and that most will be absorbed through normal attrition.

•

CAB is functioning smoothly under new Chairman Chan Gurney, with morale of most members and staffers at highest peak in years. Gurney permits little time waste at Board meetings, insists on orderly procedure, is reducing backlog of cases.

Politically, CAB is now impressing White House and Congress, with Gurney's status as Republican ex-Senator proving beneficial. But whether CAB ship has sunk too far to prevent new leadership from avoiding eventual reorganization is still open to question.

•

Recent developments point to a productive year for long-range program of air navigation development. With new Air Navigation Development Board about to start much-needed evaluation of military short-range navigation system, Air Coordinating Committee named a top-flight group to study overall "common system" transition program.

New funds and stronger membership could spell success for ANDB. After suffering vital budget cuts last year, Board may be bolstered by $4 million appropriation from Defense Department. Membership will probably be at assistant secretary level. Don't rule out possibility that Donald Quarles, Assistant Defense Secretary-Research and Development, may be named chairman.

The Washington View

McCarran's Revision

After a great many years of trying, Sen. Pat McCarran is apparently going to get hearings on his proposal to rewrite the 1938 Civil Aeronautics Act, which he authored.

The Nevada Democrat has introduced new legislation this year (see page 16) to accomplish a complete redraft (S. 2647) and Senate Commerce Committee Chairman John Bricker (R., O.) has promised to give the bill early action. What course Bricker will take was to be determined at a committee meeting being held as this issue went to press.

It has been uncertain whether the full committee or a standing subcommittee will review McCarran's bill, but one thing seems certain—there will be hearings. If nothing else is accomplished, the hearings will at least provide the industry with a sounding board—an opportunity to "air" a great many things.

Aside from the bill's reorganization provisions, which it is not believed will be favorably considered, S. 2647 presents to Congress for the first time a legislative solution to the non-scheduled airline problem. That is, the bill would bring all segments of the industry under regulatory control.

Undoubtedly hearings on McCarran's bill will be considered a sort of substitute for the Civil Aviation subcommittee, which was headed by Sen. John S. Cooper (R., Ky.) until he left the full committee this year.

High-Level Job Hunt

Change in CAB Chairmanship from Oswald Ryan to Chan Gurney led also to displacement of Ryan by Gurney as CAB representative on the Air Coordinating Committee. Ryan, then seeking an Eisenhower designation to some aviation post, almost succeeded in displacing Democratic CAB member Joe Adams on the National Advisory Committee for Aeronautics.

But the deal has been stalled, perhaps permanently. There is only room for one CAB man on NACA. Political partisanship generally does not prevail for the non-compensatory posts which, in the case of government members, are for no fixed duration. Adams qualified for the NACA job on the strength of his technical knowledge; he also had full consent of CAB members.

Ryan, with limited technical knowledge and no CAB support, almost unseated Adams, with backing from Commerce Secretary Weeks and Under Secretary Murray. Republican National Committee may still want a Republican Board member in the job, but Ryan's chances are considered slim.

Shuffle in the Senate

The Republican shuffle of Senate Committee assignments for the current session of Congress had the greatest impact on the make-up of the Commerce Committee. The changes may have a decided bearing on the Committee for the treatment of Civil Aviation.

Except for Chairman John W. Bricker (Ohio), who first joined the Committee in 1949, the balance of the Republican line-up has been completely revamped. Four out of the seven Republican members—Senators Schoeppel (Kan.), Butler (Md.), Potter (Mich.), and Griswold (Nebr.)—were only appointed to the Committee during the first session last year. The other three—Senators Duff (Pa.), Turtell (Conn.), and Payne (Me.)—are newcomers.

One of the former Republican members who traded Committee assignments was Senator John S. Cooper (Ky.), head of the Civil Aviation subcommittee, the future of which is in doubt.

Unprofitable Tenants

Whether federal government agencies are paying fair rents—or any rent at all—at airports is a question that will be part of the ACC aviation study ordered by the President.

In recent years the Post Office Department has begun paying going rates for its space: right now it is paying at about 90% of the airports. CAA pays rent for facilities not directly tied in with direct aid to airports. Weather Bureau receives free space since it is covered by the Federal Airport Act.

Worst offenders in chiseling free airport space are U. S. Customs, Immigration, and Department of Agriculture.

Rock-Bottom Air Freight

Air Force is getting rock-bottom cargo rates from civil air carriers in the Pacific airlift. When bids were accepted for February and March (scheduled to be last two months of civil participation) California Eastern, Seaboard & Western and Overseas National won with lowest proposals ever submitted in the lift.

The carriers won't make any money, but contracts will enable them to hold organizations together in hopes of securing other types of business in near future. Winning bids aren't announced, but best guess is that AF cargo will be delivered in Japan for about 13¢ a ton-mile.

. . . Preble Staver

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OTHER PUBLICATIONS . . .

American Aviation Daily, a daily news service for the entire industry. $200 per year. Managing Editor: Keith Saunders.

American Aviation Directory; twice yearly listing of products, people and organizations, $7.50 each. Managing Editor: Marion E. Grambow.

Official Airline Guide; Monthly publication of airline schedules and fares. $13.50 per year in USA; $14.00 in Canada; $15 elsewhere. Published from 139 N. Clark St., Chicago 2, Ill. Central 6-5804. Managing Editor: Robert Parrish.

American Aviation Traffic News (incorporating Air Tariff Reports): Daily rates and tariff news. $150 per year. Managing Editor: Wallace I. Longstreth.

When & Where

Feb. 2-5—Aeronautical Radio Inc., Airline Electronic Engineering Committee, Statler Hotel, Washington, D.C.

Feb. 3—25th Anniversary Simulated Flight, Link Aviation, Inc., Binghamton, New York.

Feb. 3-5—Society of Plastics Industry, 8th Annual Division conference on reinforced plastics, Edgewater Beach Hotel, Chicago.

Feb. 4.—Instrument Society of America, 8th Annual Regional Conference, Statler Hotel, New York.

Feb. 4-6—Institute of Radio Engineers, 6th Southwestern Conference, Hotel Tulsa, Tulsa, Okla.

Feb. 11-12—2d Annual Western Computer Conference & Exhibit, sponsored by American Institute of Electrical Engineers, Institute of Radio Engineers & Association for Computing Machinery, Ambassador Hotel, Los Angeles.

Feb. 18-19—Institute of Radio Engineers & American Inst. of Electrical Engineers, transistor circuits conference, Philadelphia.

Feb. 21-23—3d Annual Texas Agricultural Aviation Conference, Texas A&M College, College Station, Texas.

Feb. 24-26—Ohio-Indiana Agricultural Aviation Conference, Ohio State University, Columbus; write Ohio Aviation Board, 501 Wyandotte Building, Columbus, for program.

March 5-7—Society of Women Engineers, National Convention, Mayflower Hotel, Washington, D.C.

Mar. 22-25—Institute of Radio Engineers, National Convention, Waldorf Astoria Hotel & Kingsbridge Armory, New York.

Apr. 12-14—Airport Operators Council, 7th Annual Meeting, Tampa, Fla.

Apr. 12-15—Society of Automotive Engineers, Aeronautic Meeting, Production Forum & Aircraft Engineering Display, Statler Hotel, New York.

Apr. 22-23—American Inst. of Electrical Engineers, conference on feedback controls, Claridge Hotel, Atlantic City, N. J.

Apr. 29-30—American Society of Tool Engineers, 10th biennial industrial exposition, Convention Center, Philadelphia.

May 5-7—3d Int'l Aviation Trade Show, sponsored by Aircraft Trade Shows, Inc., 71st Regimental Armory, New York.

May 7-8—National Convention & Air Meet, National Inter-Collegiate Flying Assn., University of Illinois, Champaign-Urbana, Ill.

May 10-12—Institute of Radio Engineers, National Conference on Airborne Electronics, Dayton Biltmore Hotel, Dayton, Ohio.

May 16-19—American Association of Airport Executives, National Convention, Standiford Field, Louisville, Ky.

June 7-10—Society of Plastics Industry, 6th National Exposition, Cleveland, O.

June 21-24—Inst. of the Aeronautical Sciences, annual summer meeting, IAS Building, Los Angeles.

INTERNATIONAL

Apr. 5-6—Society of Plastics Industry (Canada) Inc., 12th annual conference, Mount Royal Hotel, Montreal.

Apr. 10-13—German Air Show, Rhein-Main Airport, Frankfurt, Germany.

May 12-14—Engineering Institute of Canada, Annual Meeting, Quebec.

May 31-June 11—Canadian International Trade Fair and National Air Show, Toronto.

They're flying on top of the world

Allison's service representative on assignment with the 318th Fighter-Interceptor Squadron at Thule Air Base didn't know he was writing an advertisement when he sent the following report—but we think you'll be interested in these comments from northern Greenland:

"I am sending a few pictures taken at Thule shortly before old Sol set for its last time here in the Arctic. I am sure that these pictures will be of interest—with a caption indicating satisfactory performance of the Allison J33 engine even in these adverse conditions, some 800 miles from the geographic North Pole, and almost due east of the magnetic pole.

"The Air Echelon overseas movement of the 318th with Lockheed F-94B's was made from McChord Air Force Base, Washington to Thule. This move, made without incident, indicates not only the pilots' capabilities and outstanding maintenance of equipment, but also the rugged dependability of the J33 engine. During the first four months of operation here, even with the onset of the Arctic night and extreme temperatures, this squadron is still logging hundreds of hours of combat-ready flight a month.

"I believe it would be quite fitting for Allison to indicate its appreciation of the Squadron's unrelenting confidence in the J33 engine and its prolonged effort toward making jet fighter operations both possible and practical in the far northern reaches of the globe."

Allison greatly appreciates this opportunity to salute the 318th Squadron of the Northeast Air Command for its splendid record in maintaining vigilant guard at the top of the world.

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Letters

Letters should be addressed to The Editor, American Aviation Magazine, 1025 Vermont Ave., N.W., Washington 5, D. C. Anonymous letters will not be printed, but names will be withheld upon request.

SPAIN'S TRYING PERIOD

To The Editor:

I feel obliged to report to you the deplorable effect caused by your "En Route" piece on Spain in the issue of October 26. The certain deficiencies in the installation of the first North American hotel in my country (I would point out that I have no personal interest in this hotel) should not be used as a basis to give an impression of the life of a nation, particularly when the writer has stayed no more than four days in that country.

The Castellana Hilton, although the most modern hotel in Madrid, is not the best. To corroborate this I can inform you that when Mrs. Talbott, wife of the U. S. Air Force Secretary, arrived in our capital city, on learning that she was being taken to the Castellana Hilton, she merely left her baggage there and asked to be taken for dinner to the Ritz, which she had known before and liked very well.

There is a very basic explanation for the difficulties with electric power which you observed. There has been a prolonged drought, for which you cannot blame any man in particular. Moreover, it should be mentioned that the production of electricity in Spain is under an industrial development expansion program. Despite the fact that Spain has been isolated for so many years, the production of electric power has doubled since 1945.

This matter as well as any other matter concerning the backward aspects of Spain should be examined with the following facts in mind:

• **From 1936 to 1939** the nation went through great sacrifices and obtained victory against Communism at the cost of a million dead and the loss of a great part of its riches (stolen by the Reds). This was the first and only victory against Communism to date.

• **From 1939 to 1945** Spain observed a neutrality, despite numerous difficulties, that has never been properly valued or recognized.

• **From 1954 until the present day** Spain has gone through a trying period, both economically and politically, which not only put my nation beyond the millions of dollars generously made available under the Marshall Plan but also forced it into extreme isolation from the rest of the world.

It is therefore not surprising that available facilities have been devoted to the import of such commodities as gas, tractors, etc., rather than glassware, toilet paper and vacuum cleaners for the hotel. The modest and noble hands of the Spaniards are the substitute for the nation's lack of mechanical equipment such as abounds in wealthier lands.

You can be sure that Spaniards know how to honor their international obligations, and if on any occasion it would be necessary for the good of our country or that of the free world, they would not hesitate once again to shoulder arms against Communism. This is no doubt much the most important matter of all, and I am sure Mr. Eisenhower would see it that way.

FELIPE E. EZQUERRO
Dom Ramon de la Cruz, 13
Madrid, Spain

(Thanks to Reader Ezquerro, who happens to be this magazine's distinguished correspondent in Spain, for his thoughtful comments. In no way whatever did I intend to disparage the wonderful country of Spain. In fact, having covered the entire country thoroughly in 1931 and having visited there a number of times in the past few years, I consider Spain to be the single most interesting country in Europe from many standpoints. The Spanish people are amazingly hospitable, especially to Americans, and their country is a treasury of the finest art and architecture and customs on the Continent.

Spain has undergone many hardships and the droughts of 1953 have caused severe power shortages. My report on the Castellana Hilton opening was an attempt to be amusing about the sort of mix-ups one encounters with bureaucracy, which can be encountered anywhere in the world and in the U. S. as much as anywhere else. For some years I have been trying to work out plans so that I could drive through Spain leisurely and soak up, as I did in 1931, the wonderful atmosphere of what I consider to be one of the really delightful spots on this globe; I hope to do so within the early months of 1954.—WWP)

THE EXULTANT THUNDER

To the Editor:

I'm a little stunned, but very pleased! Just this morning I received a copy of the December 21 issue of AMERICAN AVIATION, which Mr. Schmidt of the Tucson Airport Authority kindly sent to me. I've now read it from cover to cover—including editorial page and advertisements—and it was a genuine pleasure to peruse a trade journal associated with the aviation industry. It is an excellent periodical, and a revelation to the uninformed layman.

More specifically, of course, I want to thank you for your gracious comments with regard to my letter concerning jets, and for reprinting the letter itself. Having two small sons of our own, we feel strongly about their future, which very probably will include a hitch in the Air Force. Aside from that, however, our family simply loves airplanes. We are looking forward to the day when we can possess one of our own.

I deeply appreciate having the opportunity to express before a wide reading audience the fundamental feelings of every good American. It is a sad commentary, indeed, upon the apathy of a portion of the civilian populace, wherein certain individuals are so afflicted with shortsightedness that they could conceivably prefer "peace and quiet" to preparedness.

The wonderful precision of jets in formation, and the exultant thunder [illegible] their passing, surely cannot fail [illegible] thrill the hearts of all those who [illegible] earthbound, but who glory in [illegible] strength and endurance of our nation.

FRANCES WA[illegible]
5514 East Texas
Tucson, Arizona

LOCAL SERVICE

To The Editor:

I was considerably disappoint[illegible] with the article on page 36 of [illegible] November 23 issue of AMERICAN AVIATION, by Mr. William V. Henzey, on [illegible] speech of CAB member Joseph [illegible] Adams to the State Aviation Offici[illegible] at our annual convention on Novembe[illegible] 9, 1953.

I am, of course, even more di[illegible] appointed in your editorial in the De[illegible] cember 7 issue, which I believe is com[illegible] pletely off the track and misses th[illegible] intent of Mr. Adams' speech. It make[illegible] me wonder if you have read the te[illegible] of Mr. Adams' speech or whether a[illegible] your information was obtained from th[illegible] article by Mr. Henzey.

In this respect, I am enclosing [illegible] copy of the official CAB release of Mr[illegible] Adams' speech. I believe you will find[illegible] on careful reading of the text of this[illegible] speech that nowhere does Mr. Adams[illegible] indicate that he has executed "a hast[illegible] 180° turn," as you mentioned in your[illegible] editorial, or that he even intends to.

Likewise you will find that nowhere[illegible] does he state that the answer to all o[illegible] the local service carriers' problems lie[illegible] with the states. I, for one, will agree[illegible] with you, and I believe that nearly al[illegible] of the state aviation officials will agree[illegible] with you, that the states cannot solve[illegible] all of the problems. A careful reading[illegible] of the text of Mr. Adams' speech will[illegible] indicate that he does not think so.

The intent of the speech was simply[illegible] to provide some constructive criticism[illegible] of the states' lack of effort with respect[illegible] to local service passenger generation in[illegible] an endeavour to assist the local service[illegible] airlines. This intent was certainly not[illegible] hard to realize by anyone who had the[illegible] opportunity of hearing the speech and[illegible] certainly should not be difficult to[illegible] determine by anyone who would care[illegible] to read the printed text. As one who[illegible] did have the opportunity of being[illegible] present, I can only say that I certainly[illegible] admire Mr. Adams' courage and ability[illegible] to offer constructive criticism in such[illegible] a manner that those who are being[illegible] criticized realize their failures and want[illegible] to do something to correct them.

In this respect I would like to suggest that you read page 68 of the[illegible] November 30 issue of *Aviation Week*[illegible] which indicates some of the results of[illegible] Mr. Adams' speech.

It is my understanding that some of[illegible] the local service airline officials en-[illegible] couraged Mr. Adams to make the[illegible] speech, which is somewhat the opposite[illegible]

(Please turn to page 46)

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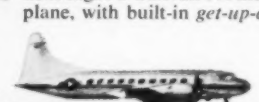

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ABC's for CAB

ONE OF THE LEAST UNDERSTOOD features of the commercial airplane is what factors make it pay off economically.

There has been a misconception, particularly in the Civil Aeronautics Board, that the mere feat of filling up an airplane automatically makes it turn a profit.

by W. W. P.

Nothing could be further from the truth. It isn't how many passengers are filling the seats so much as how far they are carried. This is just as true with buses and railroads. Each form of transport has its break-even factor in terms of distance.

We are grateful to one of the top air transport economists, Wayne L. McMillen, assistant secretary and assistant treasurer of American Airlines, for highlighting these distance factors in a speech delivered a few weeks ago at the SAE annual meetings in Detroit.

Mr. McMillen emphasized that the history of all transportation has been the losses incurred on the short-haul services. Railroad commuter service and short-haul rail passenger operations have always lost heavily.

Take intercity buses. Expenses are higher than the revenues in all distances up to about 250 miles. At 50 miles, expenses run about 2.4¢ per passenger-mile, yet the average fare is about 2¢. It is only when a passenger is carried above 250 miles that he contributes a profit; all passengers carried less than 250 miles are "subsidized" by the long-haul passengers.

Distance Must Increase

Then look at air transportation. Passengers on local service lines in 1952 traveled an average of about 195 miles. It cost about $22.00 each to transport them. Yet the average fare collected was only $11.50. In other words, while the cost was over 11¢ per passenger-mile, the average fare was less than 6¢. On this basis it is clear that no matter how well-filled the airplanes may be, the operation is at a loss until more passengers can be carried farther.

Take American Airlines itself. For a distance of only 50 miles, the cost per passenger-mile is 17.8¢, yet the passenger fare is 7.6¢. At a distance of 150 miles the cost is 9¢ per passenger-mile and the average fare is 6.3¢. At 200 miles, the cost is 7.7¢ and the average fare is 6.1¢. Thus, if American's business were all short-haul, it would either go broke rapidly or have to be heavily subsidized.

At 350 miles and above, American begins to carry passengers at a profit. It is the long-haul customers who make possible the maintenance without subsidy of such commuter hops as New York-Washington. Trunk carriers serve local stops for the purpose of generating or attracting long-haul business.

Mr. McMillen points out, additionally, that it often takes as much servicing of a short-haul passenger as a long-haul one. For instance, it usually costs the same to make a reservation and ticket a passenger going 100 miles as one going about 500 miles. Assuming that this cost of the reservation is $1.20, the cost per passenger-mile for the 100-mile passenger is 1.2¢ while that for the 500-mile passenger is .24¢. The cost of making the reservation for a New York-Boston passenger absorbs almost nine per cent of the price of his ticket. For a New York-Los Angeles passenger the reservation cost is three-quarters of one per cent of the price of his ticket.

This characteristic is true of a large portion of the ground operations expense, traffic and sales expense, landing fees, etc. These items cause a sharp taper in costs with distance.

Thus it is that if some way could be found for the short-haul passenger to pay his way, air transport would not have to depend on either subsidy in the local field or long-haul passengers in the trunk field to pay the local-haul bills. The same goes for railroads.

It is this understanding of the break-even factors in transportation—break-even of costs and revenues in terms of distance, and not of an arbitrary seat-load factor—which the CAB has failed to take into account in its projections of a balanced air transport network. If the CAB some years back had properly understood these factors, it would not be faced with quite as many glaring and troublesome problems as it now has.

Two Pioneers Depart

In a period of less than two weeks world air transportation lost two of its great pioneers. Albert Plesman founded and led to top rank among the world's biggest and best systems the KLM Royal Dutch Airlines. He was a man of stature and depth and will be greatly missed, not only in The Netherlands but throughout the air transport world. Thomas E. Braniff, about whom we wrote a personal appraisal last summer on the 25th anniversary of Braniff International Airways, played a vital role in U. S. air transport from the earliest days. He, like Plesman, became a citizen of the world. His passing is a severe loss to both his company and the industry.

No Comment Needed

The railroads recently requested a mail pay increase of 45%.

The Post Office succeeded in scaling down this request to a 10% increase.

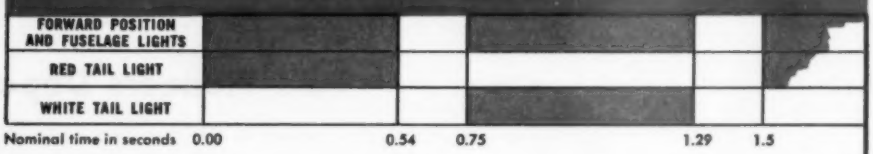
But the new 10% hike amounts to $30,000,000 annually, which is more than the entire yearly subsidy bill of the domestic trunk, local service, and helicopter air carriers.

. . . WAYNE W. PARRISH

For the NEW Flashing Cycle

BENDIX-PACIFIC POSITION LIGHT FLASHER

MEETS C.A.A. REGULATION TSO-C18B, DATED OCTOBER 1, 1953



These dependable, light weight Position Light Flashers, which are in service on major airlines around the world, are now available with the new flashing cycle as illustrated above.
As in previous models, the new Bendix-Pacific Assembly 554230 incorporates a constant-speed, compound-wound ball bearing motor that assures accuracy of the flashing mechanism. Internal relay action also assures synchronization of fuselage and wing tip lights with either the red or white tail light. Relay contact points are designed to handle the increased current resulting from combining the forward position lights and fuselage lights in a common circuit.
Complete information will be gladly sent on request.

ATTENTION: Owners of Bendix Flashers:

Bendix-Pacific 450250-0-3 Flashers can readily be converted to conform to the new flashing schedule through the use of Bendix-Pacific kit #552490. For more information on this kit or other service parts contact Service Dept. at 117 E. Providencia, Burbank, Calif.

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Industry Spotlight

Newest U. S. military transport turboprops will be flying soon. Convair's first R3Y (Allison T40's) has already been delivered. Next will come the Douglas YKC-124B (Pratt & Whitney T34's), which is undergoing taxi tests. Lockheed's R7V-2 (T34's) Super Constellation should fly in March, but may be edged out by the same firm's XC-130A (Allison T56's), which rolls out in February. Convair expects its Model 340 (T56's) to take to the air in April. Last will be Boeing's XC-137 (T34-powered C-97), which is scheduled for its first flight next October.

•

"H" designation for the USAF's experimental convertiplanes has been replaced by "V." McDonnell's XV-1 for reconnaissance will be ready for flight tests soon, while Bell's XV-3 tilting rotor design is not far behind.

•

Britain's Bristol Aeroplane Co. has revived its 5000-pound-thrust Saturn turbojet but redesignated the 900-pound engine the Orpheus. Observers consider the Orpheus as a logical engine for the production version of Folland's Gnat lightweight interceptor. Gnat uses an Armstrong-Siddeley Viper in the prototype. First Orpheus will be on the test bench by summer.

•

Republic has shipped its first swept-wing F-84F, which is destined for NATO nations as well as the USAF, out of the country. Plane was assigned to Ladd AFB at Fairbanks, Alaska, for 90 days of cold-weather testing.

•

Spending by the military services for plane buying as a percentage of total defense expenditures has gone up steadily since Korea, even though fiscal 1955 will see $8.3 billion spent, compared with 1954's $8.4 billion. In fiscal 1951, aircraft procurement expenditures accounted for 12% of total Defense Department spending. In 1952, it was 13%; in 1953 it accounted for 17%; about 20% in 1954; and 22% in the coming fiscal year.

•

First of France's family of delta-wing fighters has taken to the air. The SNECMAS 1402 Gerfalcon experimental craft, which uses an Atar 101B turbojet, made its first flight last month.

•

Scandinavian Airlines System is ordering the Bendix-Eclipse-Pioneer-built Polarpath Compass system for its fleet of Douglas DC-6B aircraft. Military services as well as U. S. and foreign international airlines are showing an increased interest in a universal compass system being developed by Pioneer which includes the Polarpath feature.

•

CAA evaluation tests on the McCauley full-feathering version of the Met-l-matic propeller for the Cessna 180 have been completed and approval is expected shortly. It is understood that this prop also will be used on the Cessna Model 310 small twin-engine transport.

•

Modification of 30 Navy airships into ZP3K versions with improved submarine search and detection capabilities will be completed by mid-1954 at Lakehurst Naval Air Station.

•

Army's Nike anti-aircraft missile reportedly has been more than 80% accurate in its firing tests.

Trim Trol®

has been around

(and still is!)

Trim Trol was developed in 1947 to actuate trim tabs in the prototype Grumman Albatross. This actuator proved as rugged as the new amphibian, functioned perfectly despite prolonged exposure to salt water. Soon afterward, McDonnell selected Trim Trol for the original Banshee. It has been used in every model of the series.

The same basic model continues to satisfy all demands, although aircraft design has changed radically. Trim Trol is now specified equipment in the Chance-Vought Cutlass, the Douglas Skyknight and A3D.

Meeting the requirements of MIL-A-8064 (USAF), it weighs 3½ lb., has ultimate static capacity of 2000 lb. in., and produces 300 lb. in. operating torque through 160 degrees.

The story of Trim Trol is only one example of Airborne's pioneering in the actuator field. As the evolution of aircraft design poses new problems, look to Airborne for the solutions. For more information on Trim Trol, and other actuators, see our literature in the I.A.S. Catalog.

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Accessories Corporation

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B.F.Goodrich

Tough Braniff problem solved by B. F. Goodrich dimpled tire

It seemed almost like landing on broken glass, the way gravel on certain overseas runways was playing havoc by cutting tire treads for Braniff International Airways. They scooped up a handful of "runway"—sent it to B. F. Goodrich. Could we design a tire that would resist cutting by these hard gravels?

The tire BFG engineers developed combined a new tread with other changes to give a longer-wearing tread *and* a tire that could be retreaded more often. The dimpled tread provided better distribution of the tire load and reduced exposure to tread cutting. The longer-lasting cord construction brings tires through tough landings in condition for more and easier retreading. Braniff tests indicated 20% to 50% more landings with the new tire.

They soon became standard equipment on Braniff's DC-3's, 4's, and 6's. And, of course, they're on the new Braniff Super Convair 340's. Twenty-three other airlines have also made B. F. Goodrich dimpled tires standard equipment—many on the basis of their own testing programs.

B. F. Goodrich is now producing the new dimpled tire in all popular airline sizes. It's another first in aviation tires from B. F. Goodrich, leader in rubber research and engineering.

Send this coupon if you would like more information about BFG tires or other aeronautical products. Check the items; print your name and address in the margin below (or pin to your company letterhead).

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- ☐ Wheels and Brakes
- ☐ De-Icers
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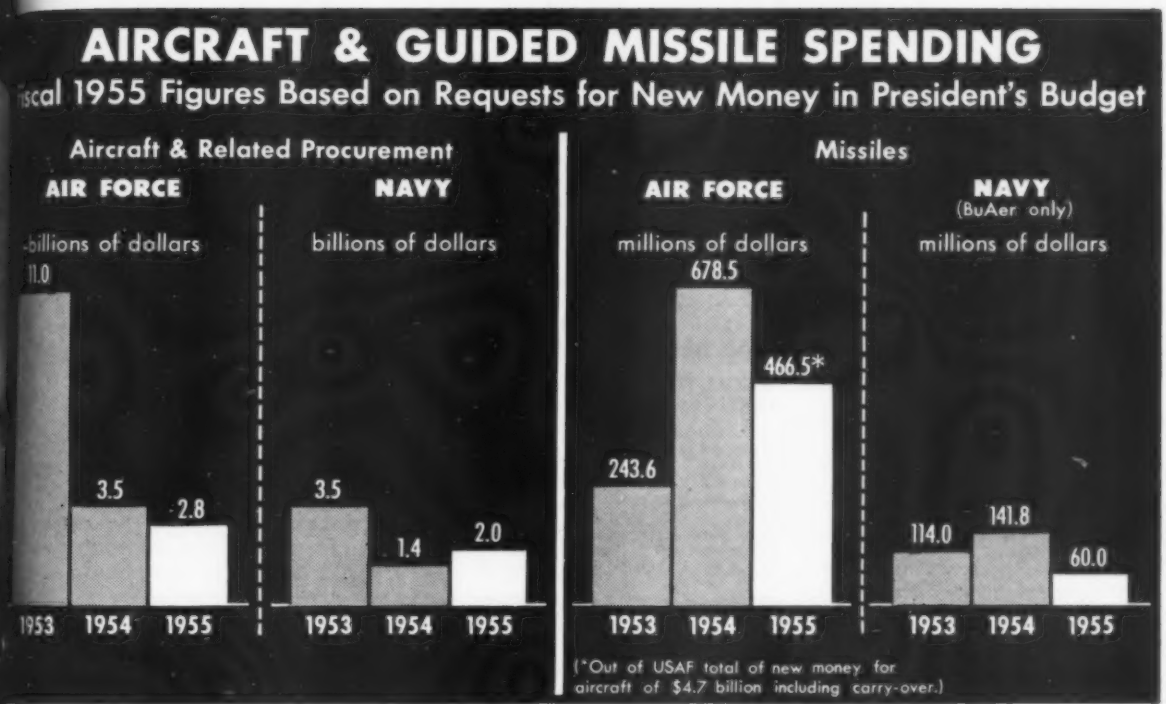


mphasis on Airpower in Fiscal '55 Budget

USAF, Navy will have $4.8 billion in new plane oney, plus $2 billion carryover from previous years.

By Robert M. Loebelson

ESPITE some appearances to the contrary, airpower finally got its e emphasis in the budget message mitted to Congress last week.

The first budget to be worked up m scratch by the Eisenhower Adistration, in the President's words, ints toward the creation, maintece, and full exploitation of modern power" and "provides greater expenures for airpower in the fiscal year 5 (which starts July 1, 1954) than ny year since the close of World r II."

The President, assuring the nation teps being taken to counteract a pose enemy air attack, reported that penditures for continental defense in e fiscal year 1955 are expected to be ater than ever before in our history."

Mr. Eisenhower, after declaring t the Air Force, Navy, and Marine rps now have a total active inventory of about 33,000 planes (a third of them jets), stated that within three years the inventory will be increased to 40,000 (with more than half jet-powered).

"At that time," he said, "the Air Force will have 137 wings—of which 126 will be combat wings—augmented by appropriate combat support units. Naval airpower will include 16 carrier air groups and 15 antisubmarine warfare squadrons, while the Marines will maintain three Marine air wings. In each case, these units will be supplemented by appropriate combat support units." (The President thus officially confirmed for the first time that the new USAF goal is 137 wings by June 30, 1957.)

These were the highlights of the President's budget message:

• **A total of $56.2 billion** in new money is requested to operate the entire government, about $4.5 billion less than in fiscal 1954, the current year. Spending in fiscal 1955 will be $65.5 billion, as against this year's $70.9 billion.

• **For the entire Defense Department,** new money requests total $30.9 billion (vs. 1954's $34.4 billion). Expenditures in 1955 for the military establishment (not including foreign military aid) will be $37.5 billion, compared with this year's $41.5 billion.

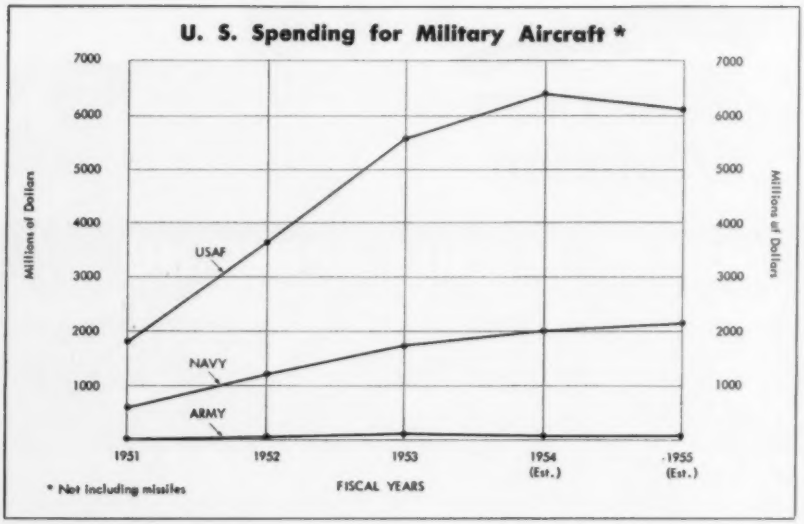
• **The Air Force,** which received $11.4 billion in 1954 in new money, is down for $11.2 billion for 1955. Total USAF spending in 1955 will be $16.2 billion, as against 1954's $15.5 billion.

• **The Navy's request** for new obli-

New Money for Department of Defense

Fiscal 1955

Office of Secy. of Defense	$13.5 million
Interservice activities	547.5
Army	8,236.0
Navy	9,921.0
Air Force	11,206.0
TOTAL	$29,924.0



	New Money		Expenditures	
	FISCAL YEARS		FISCAL YEARS	
	1954	1955	1954	1955
DEPARTMENT OF THE AIR FORCE:				
Aircraft and related procurement	$3,495,000,000	$2,760,000,000	$6,900,000,000	$6,700,000,000
Major procurement other than aircraft	600,000,000	735,000,000	726,000,000	1,075,000,000
Maintenance and operations	3,155,000,000	3,655,000,000	3,050,000,000	3,400,000,000
Military personnel	3,285,000,000	3,400,000,000	3,200,000,000	3,300,000,000
Research and development	442,120,000	431,000,000	460,000,000	430,000,000
Reserve personnel requirements	14,900,000	28,000,000	20,000,000	25,000,000
Air National Guard	147,100,000	160,000,000	120,000,000	150,000,000
Contingencies	31,000,000	31,000,000	30,000,000	30,000,000
Acquisition and construction of real property	240,776,000	.....	950,000,000	1,079,000,000
Preparation for sale or salvage of military property (annual indefinite, special account)	6,000,000	6,000,000	5,000,000	5,000,000
Total	11,416,896,000	11,206,000,000	15,461,000,000	16,194,000,000
DEPARTMENT OF THE NAVY:				
Aircraft and facilities	$943,000,000	$971,100,000	$900,000,000	$950,000,000
Aircraft and related procurement	1,379,000,000	1,987,000,000	2,400,000,000	2,450,000,000
NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS:				
Salaries and expenses	$51,000,000	$53,600,000	$50,000,000	$52,500,000
Construction and equipment	7,239,000	4,620,000	7,435,000	7,400,000
Construction and equipment (liquidation of contract authorization)	4,200,000	.....	6,065,000	1,600,000
Miscellaneous: Construction and equipment, unitary plan	.....	.....	27,500,000	15,500,000
Total	62,439,000	58,220,000	91,000,000	77,000,000
CIVIL AERONAUTICS ADMINISTRATION:				
Salaries and expenses	$104,835,000	$96,450,000	$103,488,000	$96,458,000
Establishment of air-navigation facilities	7,000,000	5,000,000	13,939,871	12,000,000
Establishment of air-navigation facilities (liquidation of contract authorization)	.....	.....	601,628	.....
Technical development and evaluation	750,000	700,000	778,000	710,000
Federal-aid airport program, Federal Airport Act	.....	.....	1,237,000	4,608,000
Federal-aid airport program, Federal Airport Act (liquidation of contract authorization)	23,700,000	.....	18,000,00	4,700,000
Maintenance and operation of public airports, Territory of Alaska	500,000	650,000	490,000	641,000
Air navigation development	1,085,000	1,085,000	3,001,250	1,158,000
Air navigation development (liquidation of contract authorization)	.....	.....	698,750	.....
Maintenance and operation, Washington National Airport	1,350,000	.....	1,348,000	162,754
Construction, Washington National Airport	400,000	.....	385,150	100,000
Claims, Federal Airport Act	.....	.....	1,440,547	.....
Miscellaneous: Construction of public airports, Territory of Alaska	.....	.....	1,052,000	85,260
Total	138,620,000	103,885,000	146,460,196	120,623,014

gational authority is $9.9 billion, compared with 1954's $9.6 billion. Na expenditures, which will come to $1 billion in the current year, will d to $10.6 billion in fiscal 1955.

• **The Army,** which received $1 billion in new money from Congr for 1954, drops to $8.2 billion for th coming year. Expenditures will sli from $12.9 to $12.0 billion betwe fiscal 1954 and 1955.

• **USAF new money** for aircra and related procurement in 1955 is $ billion, vs. $3.5 billion last year. Spen ing for the same purpose will taper o slightly from $6.9 to $6.7 billion. How ever nearly $2.0 billion of unused pri appropriations have been made availa for obligation next year, so that the A will have a total of more than $ billion to buy aircraft, missiles, etc.

• **Navy requests** for new mone for aircraft and related procurem climbed from $1.4 billion in 1954 t $2.0 billion in 1955, while spending fo this purpose will rise from $2.4 t $2.45 billion over the same period.

• **The Army** is not seeking an new money for procurement and pro duction, but has $4.7 billion carried ove from prior years. No estimate was give in the budget message as to how muc the Army would obligate for aircra and helicopter procurement in 1955, b spending for aircraft that year was es mated at $60 million.

The following table shows how t Navy and AF expect to obligate pa of the total of $7.3 billion they are r questing for major procurement an production. Army figures are not give because no new money is being sough

(In Millions of Dollar

	Total	Navy	USAF
Major Procurement and Production	7,303	3,773	3,530
Aircraft	4,399	1,919	2,480
Guided Missiles	401	136	265
Electronics and Communications	419	114	305
Production Equipment and Facilities	38	38	...
Other Major Procurement and Production	236	109	127

One interesting point in the budget is the apparent drop in guided missi obligations.

Of the $4.7 billion the Air For hopes to have available for aircraft an related procurement, it has earmarke $466 million for missile buying fo 1955, compared with $678 million du ing the current year. The Navy Bureau of Aeronautics, which is obligating $14 million for guided missile and targe drone buying this year, is planning only $60 million for similar purchase in 1955.

• **CAA,** which received $138.6 mi lion in new money in 1954 (includin $105 million for salaries and expenses

has been cut in the new budget to $103.9 million (including $96.5 for salaries and expenses). Other big reason for the drop is that while $22.7 million was appropriated in 1954 to liquidate contracts dealing with the Federal Aid Airport Program, no such request is in for 1955. A plan to incorporate Washington National Airport was outlined (see page 16).

• **CAB,** which got $3,777,000 for salaries in expenses in 1954 is down for exactly the same amount for 1955. However, an additional $73 million for airline subsidies has been asked for CAB. Subsidy payments were previously the responsibility of the Post Office Department. Total expenditures are set at $83.8 million, up from the $57.3 million spent in fiscal 1954.

• **The National Advisory Committee for Aeronautics,** which was appropriated a total of $62.4 million in 1954, is asking $58.2 million for the coming year. Spending by the independent research agency is scheduled to drop from $91 to $77 million.

• **Commerce Department's Defense Air Transportation Administration,** the agency administering the Civil Reserve Air Fleet and making recommendations on rapid tax write-off certificates for airlines, received $73,000 for salaries and expenses for its eight employes in 1954, but the sum was shaved to $72,000 for fiscal 1955.

• **Commerce's Weather Bureau,** which was voted $27 million for salaries and expenses in 1954, was cut to $24.7 million in the 1955 budget request.

• **Post Office Department's** request for money to pay for transportation of mail by air rises from $57.8 million in 1954 to $60.2 million in 1955. Excluding the subsidies (which are now handled by CAB), the PO expects to pay $40.5 million to domestic air carriers and $19.7 million for foreign air mail service in 1955. Comparable 1954 figures were $38.6 and $19.1 million.

• • •

India Officially Ends Bilateral with U.S.

Termination of the bilateral air agreement between India and the United States has now been officially announced by the Indian government. Indications are that efforts will be made in the near future to negotiate a new agreement, but meanwhile the future operations to India of two U.S. flag carriers, PAA and TWA, are in doubt.

If a new agreement is not reached within a year the airlines would have to cease carrying traffic into and out of Indian airports (PAA serves Delhi and Calcutta; TWA flies to Bombay).

First production model of McDonnell Aircraft's F3H-IN "Demon" has been delivered to the U. S. Navy. The all-weather interceptor will be carrier-based. Design features include an all-flying tail, power-operated leading edge and trailing edge slats, and cockpit placed well forward to provide good visibility during the Demon's nose-high landing approach. Employment may climb from 12,100 to 17,000 in 18 months, partly as result.

Boeing Leads in Military Contract Gains

Nineteen of the top 20 companies receiving the largest dollar volume of prime military contracts during the three years ending last June 30 are suppliers of military aircraft and parts.

Only 11 of the 20, however, get the bulk of their business by selling airplanes and aircraft equipment in peacetime years.

Following is a listing of 41 of the top 100 defense contractors whose principal output for the armed forces involves whole aircraft, engines, parts, or electronic equipment:

Company	Ranking	Contracts Received in 3 years (in Millions)
General Motors Corp.	1	$7,095.8
Boeing Airplane Co.	2	4,402.9
General Electric Co.	3	3,459.2
Douglas Aircraft Co.	4	2,867.8
United Aircraft Corp.	5	2,816.4
Chrysler Corp.	6	2,199.9
Lockheed Aircraft Corp.	7	2,152.1
Consolidated Vultee	8	2,072.1
North American Aviation	9	1,931.6
Republic Aviation Corp.	10	1,877.7
Curtiss-Wright Corp.	11	1,746.2
Ford Motor Co.	12	1,604.8
American Tel. & Tel. Co.	13	1,491.8
Westinghouse Electric Corp.	14	1,348.2
Grumman Aircraft	15	1,043.6
Northrop Aircraft	16	999.0
Bendix Aviation Corp.	17	940.5
Sperry Corp.	18	925.4
Kaiser Motors	19	897.6
McDonnell Aircraft Corp.	21	679.7
Glenn L. Martin Co.	23	643.2
Hughes Tool (Aircraft) Co.	25	622.4
Studebaker Corp.	27	581.5
Bell Aircraft Corp.	28	504.7
Avco Mfg. (Lycoming) Corp.	29	455.8
Goodyear Tire & Rubber Co.	31	440.8
Packard Motor Car Co.	32	439.0
Nash-Kelvinator Corp.	37	397.5
Fairchild Engine & Airplane Corp.	38	371.1
Collins Radio Co.	41	332.2
Continental Motors Corp.	48	259.4
Beech Aircraft Corp.	54	215.7
General Tire & Rubber (Aerojet) Co.	55	211.6
Piasecki Helicopter Corp.	58	209.9
Rheem Manufacturing Co.	62	187.7
American Bosch (Arma) Corp.	66	167.4
Allis Chalmers Mfg. Co.	67	164.2
Hazeltine Corp.	69	159.6
Minneapolis-Honeywell Reg. Co.	72	157.7
Gilfillan Brothers Inc.	84	130.9
Borg-Warner Corp. (Pesco)	89	123.3

Charles E. Beard to Head Braniff Airways

Charles E. Beard has been named president and Fred Jones board chairman of Braniff Airways, following the death January 11 of Thomas E. Braniff, founder and president, in a private airplane accident.

Two former Mid-Continent Airlines officials were also given important posts in the new Braniff set-up. J. W. Miller, one of the founders of MCA and president before the merger with Braniff, was named executive vp.

Thomas Fortune Ryan III, a Braniff director since the merger, and former board chairman and a founder of MCA, heads the executive committee, which includes Beard, Miller, R. C. Shrader, vice president, and C. G. Adams, secretary-treasurer.

Also established by the board was a new finance committee, headed by Ferdinand Eberstadt, a Braniff director for 10 years and president of F. Eberstadt and Co., New York. Members are W. A. Blakley, Dallas, and G. D. Murdoch, Los Angeles, both Braniff directors.

Beard had been executive vice president of Braniff since 1947. He joined the company in 1935 as general traffic manager in Oklahoma City and two years later was elected vice president and a director.

Jones, who holds the newly-created board chairmanship, is president of Fred Jones Inc. and the Fred Jones Co., automobile dealerships in Oklahoma City and Tulsa. He is also owner and operator of radio station KFMJ and the Fred Jones Broadcasting Co. of Tulsa, vice president of Julian Oil Co. and a director of the First National Bank & Trust Co., Oklahoma City. He has been a Braniff director for many years.

Rocket wing pods of Lockheed's F-94C are shown above in first flight photo. Each pod carries a dozen 2.75" rockets; another 24 are in nose.

Cutbacks in Chance Vought F7U-3 Fighter

A cutback in production of the Chance Vought F7U-3 carrier-based jet fighter, due to Westinghouse J46 engines used in the Cutlass "not being available in sufficient quantities," has been announced by the Navy. The fighter will continue to be produced "at a lessened schedule rate than was originally planned," Navy officials said.

Meanwhile, Chance Vought Aircraft has laid off 1500 of its 14,700 workers with 1000 more to go shortly, and an additional 750 before the end of the year, company officials said.

Govt. Corp. May Run Washington Natl.

Action has begun on turning Washington National Airport's operation over to a government-owned corporation, along the lines mentioned in President Eisenhower's budget message to Congress.

The CAA has drafted legislation outlining functions of the corporation. It is now being reviewed by the Bureau of the Budget, which has circulated the bill for government agency comment. Budget will turn it over to the Department of Commerce as soon as possible so that Commerce can recommend it to Congress for committee action.

The government-owned corporation would use an operation-revolving fund, spending money out of receipts. Construction appropriations would have to be approved by Congress in a capital account. The funds would be repaid with interest out of receipts, amortized over appropriate periods of time. The corporation would run a business-type operation, with freedom to buy, sell, and make contracts.

Such a plan has been talked about for about seven years, but from all indications it will easily pass this session.

Lee Moore Named Secretary of ACC

Lee Moore, former transport editor of *Aviation Week*, became executive secretary of the Air Coordinating Committee as of February 1. He was appointed to the post by Commerce Under Secretary Robert B. Murray, ACC chairman, to replace Charles O. Cary, who resigned last month to join Curtiss-Wright Corp.

A native of Hartford, Conn., Moore was a Navy pilot in World War II and graduated from Princeton University's Woodrow Wilson School of Public and International Affairs in 1945. He has been in Washington for the past 3½ years as transport editor of *Aviation Week* and previously had been on the staff of a McGraw-Hill engineering publication.

Colin H. McIntosh, industry consultant and former airline official, has been retained by ACC to assist with the report writing for its forthcoming national aviation policy review requested by the President.

Douglas to Modify 100 More R4D's

Some 100 more Navy Douglas R4D's will be modified into R4D-8 versions by Douglas Aircraft Co., it has been learned. Under an earlier contract Douglas already has modified nearly 100 of the twin-engine transports (Navy equivalent of the Super DC-3) at its Santa Monica, Calif., plant.

McCarran Outlines New Civil Aeronautics Act

Legislation to redraft the 1938 Civil Aeronautics Act, which has been repeatedly proposed by the original author, Sen. Pat McCarran (D., Nev.), is now under active consideration by the Senate Commerce Committee.

McCarran's proposal this year, which has been brought up to date, is a new bill—S. 2647.

An analysis of McCarran's bill points to these major features:

• **Reorganization provision:** CAB and CAA would be replaced by a new independent Civil Aeronautics Authority, composed of seven members and an executive director. Members' salary would be $17,500 a year, the director's $17,000. There would also be created an independent Air Safety Board, which would consist of five members at an annual salary of $9,000 each.

• **Jurisdiction:** Both Federal and State jurisdiction is broadly enlarged. This is true not only for economic regulation but for jurisdiction in safety as well, the latter being expanded to include "air navigation," which completely covers navigable air space. It is provided " . . . all jurisdiction not granted to the Federal Government is hereby reserved to the several States."

• **New Powers:** The Civil Aeronautics Authority would be empowered to fix temporary mail rates and adjust them retroactively, fix and regulate rates in foreign air transportation, and plan for aerial approaches to airports, including protection of people on the ground. Zoning power is restricted so that any zoning must be worked out with the states, because the power to condemn land is eliminated.

Among other changes proposed which directly affect the air carriers are (1) hearing procedures are amended so that if no one wants a hearing there will not be one, but there is the "opportunity" for a hearing, which permits a great flexibility: (2) agreements will have to be filed only by regulation and not by law; and (3) carriers will be allowed to extend credit, which is not now provided for.

USE OF RETRACTABLE LANDING GEAR gives the Sikorsky S-56 clean lines in flight as well as added speed. Top speed is "well over 150 mph." Size of the S-56, the world's largest helicopter to go into production, is evident in lower photograph.

S-56: Biggest Sikorsky Helicopter

As combat transport for the Marines, rotorcraft will carry 26 equipped troops; price is near $500,000.

By Anthony Vandyk

BRIDGEPORT, CONN.—A commercial prototype of the world's first production helicopter comparable in size to the DC-3 will be available early in 1956. This was revealed during the first public showing here of the XHR2S, the Marine Corps' version of the Sikorsky S-56.

The rotorcraft's two Pratt & Whitney R-2800 engines, each rated at 1800 hp, are slung outboard of the fuselage on short wing stubs and thus virtually the entire fuselage is available for payload. The manufacturer's guaranteed disposable load for the XHR2S version is understood to be 6500 pounds.

The Marines have announced that the XHR2S carries "two combat assault squads—that is, about 26 fully equipped men," but the commercial version will accommodate up to 38 passengers.

Sikorsky Aircraft is temporarily keeping quiet on the economics of the S-56, but a company official described it as an "ideal" vehicle for routes such as New York-Washington and London-Paris. Price, observers believe, might be in the neighborhood of $500,000 contrasted with the much smaller single-engine S-55's tag of $137,500.

In addition to its contract from the Marine Corps, Sikorsky Aircraft has a U. S. Army order for a version of the S-56 designated H-37A. Also under development is a turboprop version of the S-56 powered by two Allison T-56's. With its present two R-2800's (the same two engines which power the Convair 240/340 and the Curtiss C-46) the helicopter is noisy, and its noise level probably would be unacceptable in downtown city areas, particularly at night.

Sikorsky Aircraft is well aware of the noise problem associated with helicopters, but points out that in operating into built-up areas the resonance between buildings is as large a factor as the direct noise from the rotorcraft. A Sikorsky corporation S-51 has therefore been fitted with a Maxim silencer, which has proven to be quite satisfactory. The silencer does not reduce the amount of noise, but merely changes the frequency; the effect on the human ear, however, is the same in both cases.

Top Speed: Over 150 mph

Two engines plus retractable landing gear make the S-56 a very fast aircraft (by helicopter standards) with a top speed of "well over 150 mph." Power can be supplied to the main wheels to enable the S-56 to taxi without the use of its rotors. Both the five-blade main rotor and the small four-blade tail rotor fold for easy handling and orderly stowage aboard carriers.

Another feature of great value for military operations is the helicopter's ease of loading vehicles. Two rounded doors forming the lower nose can be opened and a ramp lowered between them. Three jeeps or howitzers can be carried. The S-56 has a two-pilot cockpit, an automatic pilot, and anti-icing equipment.

Sikorsky Aircraft has so far built three S-56's and will construct a pilot production series at its headquarters plant in Bridgeport. Main production of the helicopter will, however, be handled at a new branch factory in nearby Stratford. Ground will be broken early this year and the Stratford plant, with over 500,000 square feet of production space, should be finished before the end of 1955.

Meanwhile the company's chief production item continues to be the S-55. Preparations are well advanced for phasing in an enlarged version of the S-55 known as the S-58 (Army designation H-34) and Sikorsky Aircraft has high hopes of selling more of the former and sizeable quantities of the latter to commercial operators.

Safety Factor

While strongly in favor of multi-engine helicopters for their superior performance characteristics, Sikorsky Aircraft warns against associating safety with the premature introduction of multi-engine rotorcraft. The company recalls that initially there were a multitude of difficulties that arose from the introduction of multi-engine fixed-wing aircraft which in fact made them less safe than their single-engine predecessors.

Sikorsky Aircraft believes that the moderate size and relative simplicity of the single-engine helicopter make it ideal for the pioneering of commercial rotorcraft operations pending availability of the twin-engine S-56 in two or three years' time. • • •

Four Questions on Airlift

• **Did the lack of military airlift** or air logistics by the United States have any effect on the outcome of the Korean War?

• **Might the United Nations have won** the Korean War if there had been in being an adequate airlift?

• **Is adequate attention being given** to air logistics in today's military planning?

• **Could air logistics reduce** the cost of our foreign base program without reducing our defensive and offensive capabilities?

These questions were put by AMERICAN AVIATION to a man who by his experience is singularly well equipped to answer them: John R. Alison, former Assistant Secretary of Commerce for Aeronautics and a recognized authority in the field of air transportation, who is now serving with Northrop Aircraft as administrative vice president. He has also been prominently associated with the Transit Van Corp., a company marketing a complete new system of packaging adaptable to plane, train, and truck use (see page 32).

What Lack of Airlift Cost Us in Korea

Six weeks delay in arrival of troops may have cost us victory; will we let it happen again?

By JOHN R. ALISON

PRIOR to the Korean war the United States had two divisions within its continental limits in a state of readiness. These divisions were dispatched upon the outbreak of the Korean war to that theater, the first division arriving approximately six weeks after the outbreak of hostilities, and the second some time later.

Alison

If these two divisions, with all of their requirements for operational effectiveness, could have been placed at General MacArthur's disposal in the first week of hostilities, the enemy might have been so unbalanced by this decisive action that he could have been defeated before the entry of the Chinese Communists into the war.

Short of a quick victory we can speculate at length on the savings in dollars and lives which such a capability would have given us.

The lack of military airlift and a plan to utilize such lift had an adverse effect on our ability to prosecute the Korean War.

Military strategists may question the advisability of accepting combat under conditions such as those imposed upon us by the conflict in Korea. However, for diplomatic or other considerations, we may be faced with similar situations in the future. An air logistics system which will quickly deploy the requirements of war and efficiently resupply our forces in the field may well discourage an enemy from such overt action.

Often the mistake is made of trying to place a value on air logistics in terms of the cost of transportation alone, rather than in terms of the total cost of a complete operation. Economies of military air lift must be evaluated in terms far more important than the cost of moving material from one place on the earth's surface to another.

Transportation is but one of the many costs of modern war: Its effectiveness can reduce or enlarge the other costs far out of proportion to the cost of the transportation itself.

How do we place a value on winning a war, or estimate the cost of losing one? What value do we place on the dollars and lives which might be saved if modern weapons make it possible victoriously to terminate a war one month or even one day ahead of schedule?

If a modern system of air logistics provides us with one such weapon I am certain that the beneficial effect on the national economy will be many times the cost of acquiring such an air logistics capability.

Consider a hypothetical attack on the territory of Alaska. It is not unreasonable to think that in case of a war with Russia an airborne invasion of the territory of Alaska might be launched for the purpose of taking our air ba there.

How do we estimate the cost clearing the sea lanes so that supplie can be moved up the Pacific coast support of this territory? Add the cos of anti-submarine action to the cost cargos lost from enemy sea and a attack, to the possibility of port co tamination through atomic attack, an air transportation not only begins look relatively inexpensive but it a pears that it may be the only practic way effectively to support our garriso there.

In the past, military stocks of per sonnel and material have been move into the field in a general build-up pri to action against the enemy. Men were garrisoned in far places around th earth because it was impossible to ge them to such places rapidly in th event of hostilities. Inventories were bought and transportation charges were paid to meet contingencies which often never arose.

If an air logistics system is deve oped which can move material an transport troops to theaters as fast a they can be used, much of the long and costly build-up of personnel and mate rial will not be required. In many cases the requirement for moving the mate rial outside the continental limits o the United States will never exist. Such theorizing can lead to the hypothetica conclusion that the men and materia of war can be based within the con tinental limits of our country and onl moved overseas when required for a specific task at a specific place.

Great New Weapon

America has a great new weapon within its grasp. It is the speed of air transportation with the flexibility and economies which it brings to a modern war machine.

As the art of war becomes more complex and the instruments of war more expensive, the requirements for a modern air logistics system become more pressing by the day. It is hard to believe that in this modern age we have moved our weapons into the air and we continue to leave our logistics on the ground.

The capability to move our men and weapons rapidly to any part of the globe should make it possible to de fend our country successfully and meet our overseas commitments with less men and less material. It would elimi nate much of the expense of overseas base installations by allowing us to hold our combat teams within the United States.

Such a system in the long run should increase the effectiveness and

FIRST commercial tvor to be installed by COLLINS RADIO

The first purchase of TVOR by any city in the U.S. was made recently by Santa Monica, California, for use at Clover Field. The equipment chosen — Collins.

Packaged Terminal Visual Omni Range equipment has been in the experimental stage for some time, but not until Collins Radio developed the equipment purchased by Santa Monica has any TVOR actually been purchased by a municipality for use at its airport.

Collins TVOR is to be installed on Clover Field (location of Douglas Aircraft) early next year. It will be operated by the city. Negotiations were completed through Collins' authorized dealer, the Airesearch Aviation Service Company.

COLLINS TVOR installation similar to that purchased by Santa Monica

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reduce the cost of maintaining our military establishment. The impact of such a development by the military on our commercial air transportation systems would have a beneficial effect on the national economy for generations to come.

The military services have done much valuable planning towards such a system. Our industry can now produce the components. However, I am afraid that through lack of understanding of what modern development has made possible in the field of air transport and of its far-reaching import, proper attention and support at the higher levels of our government have been lacking.

To those who say we cannot afford the costs of such a capability, I say that we cannot afford to be without it. •••

Twin Cessna Performance Figures Revealed

First performance figures on the Cessna Model 310 twin-engine, five-place transport reveal that it will sell for $49,950 fly-away-factory, and that it has a top speed of 220 mph and a range of up to 1000 miles.

Other specifications:

• **Cruise speeds** are 205 mph with 70% power at 8000 feet; 190 mph with 60% power at 10,000 feet; and 175 mph with 50% power at 10,000 feet.

• **Range** with 60% power at 10,000 feet is 875 miles and at 50% power, 1000 miles.

• **With a 4600 pound gross load,** the 310 climbs at 1700 feet per minute; has a 20,000 foot service ceiling and a single engine service ceiling of 7500 feet. Useful load is 1750 pounds at the 4600-pound gross.

• **Dimensions** include a 35-foot wing span, 27 foot length, and height of 10½ feet. Empty weight is 2850 pounds.

Principle features include wing tip fuel tanks, cross feed fuel system, fully-retractable tricycle gear, and no outside antenna masts or wires.

USAF Streamlines Technical Orders

The USAF Air Materiel Command has undertaken a program to streamline its Technical Order system. Aim is to improve efficiency by insuring timely delivery of TO's to users and better to maintain technical data on a current basis.

The Air Force plan involves some 25,000 items, consisting of parts catalogs, instruction manuals, inspection requirements and other technical data.

News Briefs

MILITARY

The existence of the XB-63 "Rascal" guided missile has been confirmed by Bell Aircraft Corp. The firm announced that it has been active in missile work since 1945 and that its Wheatfield facility has been entirely devoted to missiles for the past three years.

•

Forty-one per cent of the Navy's aircraft are modern types, according to Navy Secretary Robert B. Anderson. Figure stood at only 28% in June, 1952.

•

Second prototype of the Convair YF-102 interceptor has made its first flight at Edwards AFB, after being trucked from San Diego. First prototype crashed and was not repaired.

•

Two manufacturers have set up new training courses for military maintenance. Northrop's program at Amarillo, AFB, Texas, will train USAF crews in F-89D work. North American's series of 20-day courses will train Navy personnel in maintenance of T-28B's.

•

Routine maintenance for Army aircraft at Fort Sill will continue to be conducted by Spartan Aircraft Co. at that location. Only major inspections will be moved to Spartan's new overhaul base at Frederick Municipal Airport.

PEOPLE

Wayne W. Parrish, editor and publisher of American Aviation Publications, has been awarded the Streib Dobben Memorial Trophy for 1953 by TWA (see page 72).

•

Harold R. Harris, president of Northwest Airlines, has been granted an indefinite leave of absence by the board of directors, because of ill health. Malcolm S. Mackay, vice president of the continental division, will act as chief executive officer in Harris' absence.

•

The SAE's presidential nominee for 1954 is William W. Littlewood, v.p. of engineering for American Airlines, who was installed at the annual meeting in Detroit on January 13.

•

E. V. Rickenbacker, board chairman of Eastern Air Lines, has received a plaque from President Eisenhower naming him "Big Brother of the Year" for '53. Citation referred to Rickenbacker's "efforts to bring boys to good citizenship."

•

William D. Perreault, managing editor of AMERICAN AVIATION Magazine, left San Francisco on January 16 for Japan as part of a press flight staged by Japan Air Lines in conjunction with the inauguration of its new trans-Pacific service. The group participating was scheduled to return on January 28.

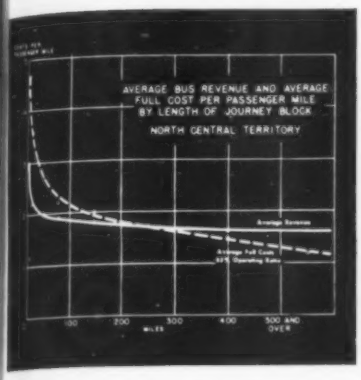
"Life" in the Jet Age

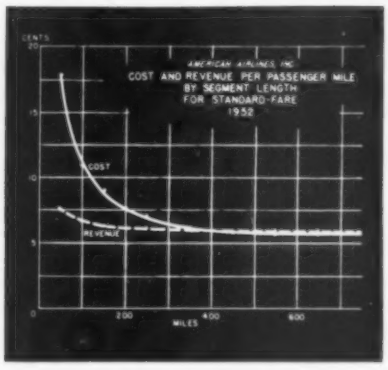
AMERICAN AVIATION was honored recently when *Life* magazine consulted two of its staff editors for an article entitled "Did the Jet Age Come Too Soon?" in the January 25 issue of the national weekly. The story appeared under the signatures of William D. Perreault, managing editor, and Anthony Vandyk, international editor, although the text was not actually written by them.

The *Life* story centers around the achievements and shortcomings of the Comet, pointing out that the series of accidents with this aircraft cannot set jet transport back. If anything, they will accelerate its development, it says. "Nothing has happened to jet transports which has not happened in varying degree to all the great transport planes on which the U.S. and the world depend," the *Life* article states. It points out that "de Havilland's pioneering revolutionized air transport" and predicts that "the bugs in the Comet will be quickly found."

The *Life* article regrettably contains a number of inaccuracies which did not originate with AMERICAN AVIATION's editors, but which could not be corrected by *Life* in the haste of meeting a deadline (one of the most unfortunate concerns the take-off characteristics of the Comet). • • •

Why Short-Haul Routes Lose Money





EXPENSES TOP REVENUES for bus passengers travelling less than 250 miles (left). For AA Convairs (right) break-even point is near 400 miles.

An Economist Looks at the Helicopter

Airline interest centers in 100-300 mile operations, provided costs don't exceed those of present aircraft.

By Joseph S. Murphy

A RASH of "irresponsible baloney"—an affliction not new to the aviation industry—is now interfering with the sober consideration of the real possibilities of the helicopter in the air transport picture.

It is the same affliction that, in one of its typical earlier appearances, gave rise to the 1946-48 estimates that in 1953 aviation would transport five billion ton-miles of air freight a year. With 1953 a matter of history, it now looks as though the traffic will be about 225 million ton-miles, only 4½% of the estimate.

McMillen

Today this irresponsible baloney takes the form of lofty predictions about the future of the helicopter—predictions that carve a large slice of the 390 million passenger bus and rail traffic over distances of 1-100 miles annually and earmark it for tomorrow's helicopter operator.

This was the candid opinion voiced recently by one of the airline industry's leading economists—Wayne L. McMillen of American Airlines. The occasion was the Society of Automotive Engineers' annual meeting in Detroit, Mich. The AA executive took the opportunity to present the industry with one of the most thought-provoking and well documented discussions of helicopter economics heard to date.

McMillen warns that it will take more than a wave of a magic wand to convert much of this traffic to the helicopter. The engineer is over the hump in making the physical operation of the machine a success, but he must now start a new phase—that of making it operate economically and competitively. As he sees it, there is still "much sweat, tears, disillusion and money loss to come."

For the real short-haul service, that of carrying passengers distances of 1-100 miles, he makes this point very plain: If the helicopter provides an opportunity to make a profit for the average carrier in unsubsidized operations, it will be the first inter-city vehicle to accomplish that feat.

First class railroads in the U. S. lose in excess of $500,000,000 yearly in this type of service. Inter-city bus companies experience similar difficulty, with their expenses exceeding revenues for each passenger carried in all distances up to 250 miles (see chart).

Air transportation, McMillen says, is no exception.

The local service airlines are familiar with this basic fact. During 1952 the average feeder airline passenger travelled about 195 miles. While it cost about $22.00 each to transport them, the average fare collected was only $11.50. The cost was over 11¢ per passenger-mile; the average fare was less than 6¢.

In stressing the still unsolved problems of the helicopter, the AA official does not want to be misunderstood. He feels that the helicopter has a great potential value for scheduled air transportation. He does not doubt that carriers are planning to use it in daily operations as soon as its economics will permit.

This is the way he sizes up the market potential:

Market Potential

• **Taxi Service** (airport-city): Success here will not be easy, even if traffic were available from all airlines, to say nothing of each airline operating this service with only a fraction of the volume. Few passengers would use the helicopter to go to an airport unless it is an hour or more from the city center by ground transportation. Even when it is an hour, the majority of people may prefer to spend that hour and $1.25, than to make the trip in 10-15 minutes and pay $10 or even $5.

• **Inter-City Service** (20-100 miles): Where surface travel is good and relatively fast, there is no great amount of time to be saved by the helicopter. In view of substantially higher fares which will be necessary, it is difficult to see how a great volume of this traffic can be diverted during the next 10 years.

For example, McMillen points to the 80-mile span from Chicago to Milwaukee, where the rail time is 75 minutes and the fare only $2.10. The helicopter may be able to cut the time to 40 minutes, but even with the unit cost at half of that presently reported, the fare would still be many times that of rail.

100-300 Mile Range

• **Inter-City Service** (100-300 miles): Here the airlines are interested in the helicopter, and this interest is not confined to a machine capable of making a profit on the operation—that could be only a dream. The airlines might very well buy the helicopter with the idea of reducing the losses now experienced on such an operation, or perhaps to improve service at about the same loss. Here McMillen emphasizes that helicopter passenger-mile costs need not be as low as airline *fares,* but rather that they must be somewhat comparable to airline *costs.*

Concentrating his economic analysis of the helicopter on this last type of operation, McMillen proceeds to evaluate today's helicopter as well as the hypothetical 30-passenger version of tomorrow.

It is not popular, he said, to begin such an analysis with the costs of helicopter services now operating. Many of those interested in the subject have completely skipped this analysis and jumped to the hypothetical figures of present machines and the larger models being tested.

He points to the variance in cost

Direct Flight Expense Comparisons

	S-55 As Reported	S-55 As Adjusted	Hypothetical 30-Passenger Helicopter	DC-3	Convair 240
PER REVENUE-MILE	$ 1.83	$ 0.78	$ 1.65	$ 0.52	$ 0.78
PER REVENUE-HOUR	133.00	57.00	223.00	77.00	128.00
PER AVAILABLE TON-MILE	3.47	1.12	0.55	0.22	0.21
PER REVENUE TON-MILE (AT 65% LOAD FACTOR)	5.30	1.72	0.84	0.34	0.32
PER SEAT-MILE ..... (200-LB. UNIT)	0.35	0.11	0.055	0.022	0.021
PER PASSENGER-MILE .... (AT 65% LOAD FACTOR)	0.53	0.17	0.084	0.034	0.032

AIRLINE S-55 operation is estimated (Column 2) by adjusting utilization to six hours, flight stage to over 100 miles.

estimates for the Sikorsky S-55. A carrier contemplating a metropolitan service using its earlier estimated costs might have expected an average direct flight cost of about $1 per available ton-mile. But things did not work out that way in practice. The 1953 second quarter direct flight costs of present scheduled operators were from $3.47 to $4.37.

This compares with about 22¢ per available ton-mile on twin-engine airplanes. Asks McMillen: "Can helicopter costs be reduced enough to replace these planes?"

Next step is to adjust present S-55 costs to place them in an operation comparable with twin-engine planes. The average flight in current helicopter service is from nine to 14 miles. For hops of 100-200 miles, McMillen believes direct costs would be about 75% of those now reported.

Utilization Difficult

Present services make it difficult to realize a good utilization—both Chicago and Los Angeles operators report two to three hours daily. This results in high depreciation charges. The analysis corrects for this by adjusting the utilization to six hours and by eliminating the unusually high percentage of non-revenue miles flown by present operators.

Taking these adjustments into account, the S-55 might possibly be flown in airline operation at stage lengths over 100 miles at a direct cost per mile of about 78¢—the same as that of the Convair. Assuming that the current 1060-pound payload of the S-55 may soon be increased to about 1400 pounds, this brings the DFC per available ton-mile down to about $1.12, or 11¢ per seat-mile.

This is about five times that of the Convair. Total operating expense would then be about $2 per available ton-mile, 20¢ per seat-mile, and over 30¢ per passenger-mile.

But McMillen feels that these adjustments are rather generous. He believes it will be many years before sizable helicopter fleets will reach six hours daily utilization. His reason: Short haul and low utility "go together."

Areas cited for possible cost reduction are:

• **Annual insurance rates,** with deductible provisions, now range up to 20% of equipment value. Pure rates, i.e. without deductions, are higher—perhaps 30% to 40%. The 20% rate for helicopters compares with only 1% for airline airplanes, so it is logical to assume these high rates will come down.

• **Depreciation costs** can be lowered. While per-pound prices of newer machines may be about the same, higher speeds will reduce depreciation costs.

Next McMillen proceeds to analyze the estimates of a helicopter manufacturer for a hypothetical 30-passenger machine with a payload of 6000 pounds and a cost of $600,000. He assumes a cruising speed of 140 mph and a block speed on longer hops of 135 mph.

Adjusted to current airline price and wage levels, direct flight costs per hour would be:

Fuel and oil (tax incl.)	$26.00
Maintenance and service	18.25
Replacement parts	48.00
Depreciation	54.00
Pilot costs	23.50
Insurance	33.25
TOTAL	$203.00

With a 10% factor for contingencies added, this helicopter would have a direct cost of $223 per hour, which is $1.65 per mile and 5.5¢ per seat-mile. Assuming a 65% load factor, direct seat-mile costs would be 8.5¢. Adding indirect expenses of 3.5¢, the total operating cost would be about 12¢ per passenger-mile.

On a 150-mile flight this cost would be about one-third higher than the Convair, and nearly double that of the Convair New York-Washington.

Using the 12¢ cost as an absolute minimum, this helicopter would require a fare, without profit, of $13.00 in New York-to-Philadelphia service. The competition here is with the railroads, not with aircraft. The rail fare is only $[illegible] and the helicopter saving in time over 45 minutes.

For New York-Boston operation the break-even fare would have to be $22.00. Here the competition could be the airplane. Air fare today including limousine is $14.65, and the time saving by helicopter only 45 to 50 minutes.

In either instance, McMillen feels that not many passengers will pay the premium. Since these costs represent the next generation of helicopters, he has serious doubt that they will come into general use by the airlines.

What are the future potentials in helicopter development? McMillen suggests:

• **Military support:** National defense authorities may decide that the importance of the helicopter justifies the build-up of a large fleet and a pool of trained personnel through subsidy on a grand scale. It might be cheaper than for the military to maintain the machine and personnel without any compensatory income.

• **Expanded operation:** Present helicopter services at New York, Chicago and Los Angeles are sufficient "proving grounds," and CAB may desire to weigh their progress carefully before undertaking expensive hearings on the other 46 applications now pending.

• **ATA study:** In many respects the discussion is quite premature. Requirement that seat-mile operating cost not exceed that of twin-engine airplanes for comparable distances may be too severe, since added revenue to the extent of limousine fares could be gained to offset higher costs. But granting even this, the job of lowering the $223 estimate for tomorrow's helicopter to a goal of $125 an hour remains a real challenge to the engineer. • • •

IAS Names Atwood President for 1954

The Institute of the Aeronautical Sciences has named J. L. Atwood, president and director of North American Aviation, Inc. as IAS president for 1954.

Newly elected vice presidents of the Institute are: William A. M. Burden of W. A. M. Burden & Co.; E. S. Thompson of General Electric; E. T. Price of Solar Aircraft Co.; and J. W. Larson of Convair.

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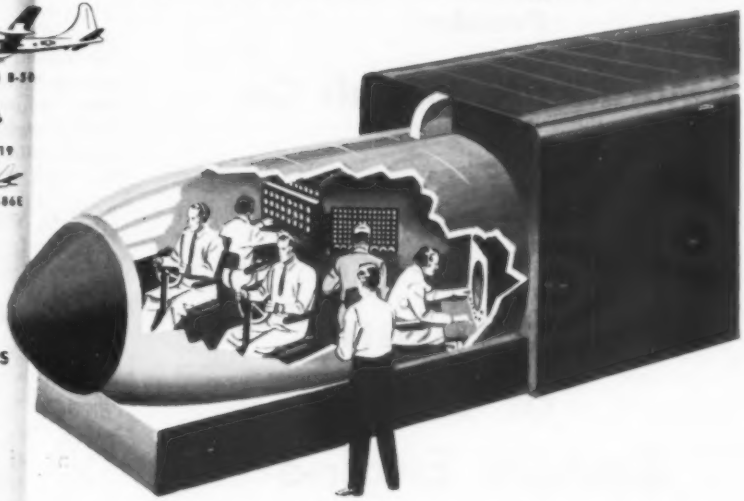

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Only through electronics is such flight simulation possible. Only Curtiss-Wright, with basic patent rights in this field, and its licensees, build Simulators and Duplicators for both the Armed Services and commercial airlines of the world.

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Interview

With

Roy Marquardt

President

Marquardt Aircraft Co.

• • •

The Future of the Ramjet Engine

• • •

Roy Marquardt, president of Marquardt Aircraft Co., shown on the cover standing before the new full scale free jet test cell, at 36 is considered to be the youngest chief executive officer in the aircraft engine business. Specializing in ramjet engines for guided missiles and supersonic aircraft, the company was formed by Marquardt in 1944 to subcontract engine construction for the Navy BuAer, while he conducted research for development of a subsonic ramjet engine at the University of Southern California.

Marquardt received his aeronautical engineering degrees at California Institute of Technology in 1940 and 1942. While working for his degrees he taught both mathematics and aerodynamics at the University of Southern California. In 1942 he joined Northrop Aircraft in Hawthorne, Calif., where he served as engineer in charge of Navy research.

He maintained his association with USC while with Northrop, and in 1944 was made director of aeronautical research for the university. It was at this time that the BuAer contract enabled him to found his company in November, 1944.

The company was incorporated with a capital of $1000. By 1948 it employed 150 skilled personnel and did a million-dollar-per-year business. The company now employs 1100 and has an annual payroll of $6,300,000.

Marquardt is credited with developing the ramjet engine to its present state and for amassing much technical and test data on the subject for the government.

Q. Would you comment on the ramjet field in general?

A. A ramjet appears to be the most promising power plant for future medium and long range supersonic missiles and aircraft. It also fills an important need for a light inexpensive powerplant for target drones and short range helicopters.

We have manufactured subsonic ramjets in appreciable quantities, and there are now excellent experimental supersonic ramjets in this country. Certainly there is still room for improvement in basic performance qualities, but the real problem still remaining is to turn these experimental engines into components of practical weapon systems which will work repeatedly and reliably.

Q. What characterizes a good experimental ramjet?

A. It must have a wide operating range with reasonable performance and reliability. By wide operating range I mean that it must be capable of operating from fuel-air ratios well above maximum thrust to as lean as required for the particular application, over a complete range of speeds and altitudes.

We at Marquardt have solved this problem by effectively building a smaller ramjet within the main engine. We operate both burners for maximum thrust, shutting off part of the engine to leave the other part operating for cruising. Besides widening the operating range, this gives us good efficiency at both maximum thrust and cruise.

Q. Do you feel that there is a very specific limitation above Mach 2 on a turbojet?

A. Present turbojets are limited to a Mach number of about 2. As materials and designs improve we expect to see a gradual increase to perhaps Mach 3. In contrast, ramjets are just getting a good start at Mach 2, have no particular problems up to Mach 4, and can be expected eventually to fly at a Mach number of 6 or greater.

Q. What is the nature of the turbojet speed limitation?

A. At present it is a combination of temperature limitations on the turbine wheel and air flow limitations through the machine. As these limitations are gradually removed we run into a very real new limitation: The optimum mechanical compression ratio of the turbojet gradually decreases with speed in the supersonic range, so that a turbojet designed for very high supersonic Mach numbers will effectively have a compression ratio of 1.0, i.e., be a ramjet engine.

Q. A few years ago the comment seemed to be that above Mach 1.2 the ramjet would come into its own. Now this seems to be Mach 2 or higher?

A. I don't believe that anyone really familiar with the ramjet and its capabilities ever forecast that it would "come into its own" at 1.2. It is true that the thrust per unit weight of a ramjet surpasses that of a turbojet at a Mach number of about 0.5; however, the specific fuel consumption and the thrust per unit of frontal area does not equal or surpass the turbojet with afterburner until a Mach number of about 2.

Up to a Mach number of about 2 the specific fuel consumption of a ramjet varies inversely with the speed. In other words, if it is four pounds of fuel per hour per

'Low cost and high reliability': ramjet advantages

pound of thrust at Mach 1, it is eight at 0.5, and two at Mach 2. The thrust, on the other hand, is increasing with the square of the speed. If it is 10,000 pounds at Mach 1, it is only 2500 pounds at 0.5 and 40,000 pounds at Mach 2.

Obviously the ramjet cannot compete in all respects with the turbojet until Mach numbers well above one are obtained.

On the other hand, we should not overlook the fact that it is the weight of the engine, plus fuel, which is of utmost importance in flight propulsion. Due to the ramjet's light weight, for short endurance the ramjet is more attractive than the turbojet, even at quite low subsonic speeds. Applications to target drones and helicopters are examples.

Low cost and high reliability are also inherent advantages of the ramjet engine.

Q. Since you have to have another engine to get the aircraft up to speed, why not continue to use it? Why bring along another powerplant for the high speed part of the flight?

A. First, I would like to point out that we do not always need a boost powerplant. In the case of the air-to-air or air-to-ground missile launched from a supersonic mother aircraft, the ramjet can take over, accelerate, climb, and cruise the missile without other assistance. Here the ramjet is more attractive than either the turbojet or rocket for nearly any endurance or range.

This is equally true in the case of the supersonic missile launched at subsonic speeds. In fact, we are quite sure it is quite feasible to accelerate from subsonic speeds to supersonic speeds with ramjet power alone.

The area, then, where your question applies is limited to the case of the surface-launched missile. The high acceleration rocket offers the most efficient way to boost the ramjet up to speed for this application.

Obviously, if the range is very short there is no need for the ramjet, since a missile can coast to its objective. However, if the range is more than a few miles, the fuel consumption of the rocket is so high—on the order of 5 to 10 times the specific fuel consumption of a supersonic ramjet—that it pays to add the ramjet powerplant.

If for some reason we can't use the high acceleration rocket boost, perhaps due to personnel limitations, we can also do the boost on the job with a turbojet. Then if the maximum flight speed is subsonic, I agree that there is no point in using a ramjet. If the maximum speed is transonic, we need a ramjet but in the form of an afterburner. We develop and manufacture these too. If the maximum speed is in the high supersonic range, we are forced to turn off the turbojet and use a ramjet in order to have enough thrust to fly.

Q. There are rumblings to the effect that a few years back the ramjet was just a stovepipe with fuel and that it is now getting more and more complex.

A. It is unfortunate that the "flying stovepipe" title was ever hung on the ramjet. It has misled many people. One prominent missile designer, for example, still takes the stand that all he needs to do is leave a hole in his aircraft and someone in the ramjet industry will fill it. Although we have a far easier job than anyone else in the air-breathing powerplant business, it's still not this simple.

The ramjet shell construction is still quite straightforward and not much different from the structure of the aircraft. However, the problems of developing the inlet and burner are large and both the development and construction of the ramjet fuel system are about the same as for a turbojet.

Don't overlook the fact that we may be asked to bring a 100,000 horsepower engine up to full power in one second without failure—a job that often takes a half day with industrial equipment of this size—and then be asked to control the engine with greater precision as the missile climbs vertically at a Mach number of 2.

Could a Stovepipe Do It?

Another complication arises because we are generally asked to supply rotating power with constant rpm to drive hydraulic pumps and alternators for a missile. I would like to see any stovepipe do this job.

Q. Do you consider that there are production ramjets today?

A. We produced our subsonic RJ-30-MA-6 engine for the Martin KDM-1 target in production quantities several years ago. To the best of my knowledge, no information has been released on production of supersonic ramjet engines.

Q. What form of designation do ramjet engines have?

A. The RJ number mentioned above is a military designation in which the RJ stands for ramjet, the 30 is the model number, and the MA stands for Marquardt.

Q. Whom do you consider to be your main competitors in this field?

A. Wright Aeronautical and Pratt & Whitney are both doing some work with ramjets.

For a long time our principal competitors were the airframe companies themselves, and for good reason, since the engine companies were swamped by the number of missile study programs started after World War II. As these programs have settled down and less desirable projects have been weeded out, the engine industry has taken over most of the ramjet work.

Q. Why haven't you turned ramjet accessory development over to people who are more enmeshed in that field, in the same manner that you recommend that aircraft manufacturers divest themselves of ramjet work?

A. Originally we were forced to do our own accessory development because companies in this field were very preoccupied with meeting the demand for improved gadgetry necessary to get new aircraft into the sky, too busy with subsonic accessories showing more promise of immediate production. As a result, we believe that we know much more about gadgets for high accuracy and fast response in a supersonic environment than do most of these companies.

This has been borne out by the fact that we are developing and manufacturing such equipment for the government and the aircraft and engine industry for projects unrelated to our own ramjet work.

Naturally we want to deliver the best possible ramjet engines regardless of who develops the accessories. Accordingly we have set up a new accessory division in such a way that this division must compete with the rest of the industry for our own powerplant accessory work.

We feel that this situation is basically much different from airframe people building ramjets. It has been proven to be difficult for any one airframe company to keep a sufficient flow of work to maintain adequate personnel and

facilities, whereas we have a continuing flow of powerplant projects requiring accessories.

Q. What do you mean by supersonic environment?

A. Our accessories need to operate in ambient air temperatures as high as 1000° F. and be exposed to rocket boost and vibration accelerations many times as high as in subsonic aircraft. I know that these accelerations sound fierce; however, don't forget that we are now dealing with power loadings which are expressed in terms of many hp per pound of airframe weight, as compared with the reciprocating engine picture of a few years ago where we talked about many pounds of airframe weight per horsepower. Vibration is bound to be much more serious when such little mass is present to absorb the energies involved.

Q. What type of accessories are you making?

A. They are all tied to the powerplant field, namely, turbojet powerplant controls, fuel systems, and air turbine accessory drives. Among our interesting new projects in this field we have several ram air turbines which will be used to supply emergency hydraulic and electric power for supersonic fighters in case of failure of the turbojet engine.

Q. Is there going to be much change in the fuel for ramjets and afterburners?

A. I am sure that fuels, especially for ramjets, will change greatly as we go on to higher and higher performance goals. For the one-shot missile applications more expensive fuels than gasoline can easily be afforded if they save airframe weight, since the airframe usually costs 100 times as much per pound as gasoline.

Fuels other than the conventional hydrocarbons look especially attractive in regard to both higher thrust and better specific fuel consumption. For short ramjet flights we may use solid fuels, thus avoiding the complications of pumping and metering.

Afterburners and Fuel Consumption

Q. Would you comment on the possibility of cutting down fuel consumption on afterburners?

A. Combustion efficiency and aerodynamic losses can be improved. Also, there is certainly the possibility of redesigning the turbojet engine to make the combination more attractive.

Perhaps of more importance is the effect of the afterburner on the system efficiency for cruising flight when the afterburner is shut off. Current designs cause an appreciable increase in fuel consumption—as compared with the basic turbojet—due to internal drag loss. We believe that these losses can be reduced to essentially zero.

Q. Are you working with anyone to put your ramjets on specific existing helicopters?

A. No, the only work we are doing in this field is a state-of-the-art project for the Air Force.

Q. What is the big problem as far as applying ramjets to helicopters?

A. The principal problem is to hold the ramjet together at the high tip speeds which are desirable. Obviously this can be solved, as evidenced by the successful Hiller and McDonnell machines.

The real question is what do you have after you have made the installation? With subsonic helicopter tip speeds the specific fuel consumption is so high that the machine will only be practical for very limited, short-endurance applications.

Our approach to this problem is to use the ramjet only as a helicopter boost powerplant, or perhaps as the principal powerplant for vertical flight of a convertiplane. This means that we must reduce the cold drag of the ramjet to zero when the power is shut off. I can't say how we are accomplishing this, but we are making real headway.

Q. Do you feel that the ramjet can also be used as a boost powerplant on fighters? With the type of installation, for example, that you had on an F-80?

A. The F-80 type of installation would not be practical again, due to the high power-off drag. However the same principles which I mentioned that we are using for helicopter ramjets could be applied.

We have another interesting idea for some time, namely, to combine the ramjet with a droppable tip gas tank. The fuel from the tank would be used to power the aircraft's primary powerplants during the flight to the target. The ends of the tank would then be detached so that it could be used as a ramjet over the combat area and the whole unit could be dropped for the return flight.

Q. Would you comment on your interest in pulsejets and related engines?

A. Any intermittently firing engine has a real problem in swallowing enough air—since it is "open" only part time—to provide enough thrust to overcome high speed drag. Pulsejets are also definitely limited to low altitude operations, and their fuel consumption at low speed is too high for them to be used for anything except short periods of time.

As a result of these limitations, intermittent engines only look interesting for low-speed target drones and helicopters. We built and flew the first pulsejet helicopter in this country and still believe that its potential is attractive, although for any piloted aircraft application noise continues to be a severe problem.

Q. How about other continuous-flow jet engines?

A. There are many attractive configurations, two of them being the ducted-fan (or by-pass) engine and the combined rocket-ramjet.

This latter engine has one advantage over the separate ramjet and rocket in that the rocket may be used at part throttle to keep the ramjet flame burning at very high altitudes.

Q. Where do you start to need this type of help in ramjet combustion?

A. I can't disclose maximum ramjet operating altitudes, but it is interesting to note that since burner inlet pressure is the primary controlling factor in ramjet combustion, flight speed is very important.

For example, we obtain approximately the same burner pressure with ramjets flying at 30,000 feet at Mach 0.5, 60,000 feet at Mach 2, and 130,000 feet at Mach 4.

High burner inlet temperature further aids combustion at high flight Mach numbers, so that we can anticipate satisfactory high Mach number ramjet operation at extremely high altitudes.

Q. Are you interested in the ducted-fan engine?

A. We are interested in everything in the powerplant field; however, if you mean are we working on it, the answer is "No."

Q. Do you feel that the ducted-fan or by-pass engine

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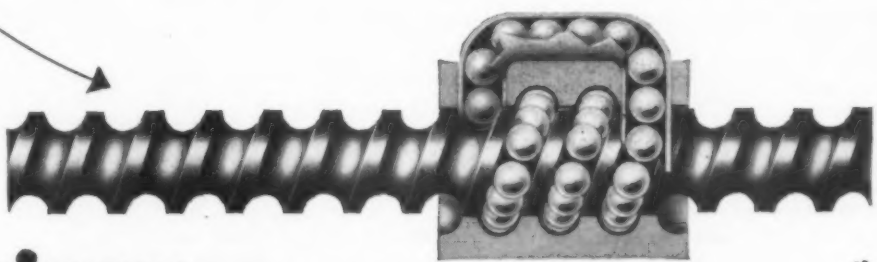

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Transport catapults at major cities

is being neglected here?

A. It certainly has been neglected in this country, which I feel is regrettable. It has some very interesting areas of application, especially in the commercial field.

Q. Is there any possibility of using the ramjet to furnish reverse thrust?

A. Not in the usual sense; however, it can be used as a type of afterburner pointing forward, fed with air bled from the turbojet compressor or turbine discharge.

Q. What peak temperatures are involved today?

A. At Mach 2 the high altitude stagnation temperature is 250° F., so we can use aluminum successfully in the ramjet forebody. At Mach 3 titanium is of interest. At a Mach number of 4 stagnation temperatures have reached 1200° F., so we will need to use high temperature steels.

Combustion temperatures reach 4000° F. even at low Mach numbers; however, we have been able to design our burner so that these flames do not directly contact the metal—which is the basic advantage that we have over the turbojet, where the highly stressed blades must be fully immersed in the flame. Even our combustion chamber materials do not present much of a problem until we are at very high flight speeds.

Q. Would you comment on production aspects of ramjets and how they will affect costs?

A. As indicated previously, the use of critical materials can be greatly limited. Engine shells are relatively easy to construct, although very close tolerances are necessary on some of the critical flow areas. Fuel controls will continue to require some high precision manufacturing.

We have delivered production ramjet engines at 40¢ per horsepower and could produce large quantities of supersonic ramjets for 5¢ to 10¢ per horsepower.

Single or Multiple Ramjets?

Q. How big will single ramjets grow before it becomes advisable to resort to multiple units?

A. Purely from an engine viewpoint, very small engines lose in efficiency, while very large engines lose in weight per horsepower so that there tends to be an optimum size engine.

From the airframe viewpoint, it is, of course, undesirable to install too many small engines. We are being pushed from this direction to produce larger units. This trend in turn, is counteracted by the test facility problem, which becomes tremendous if the ramjet engine grows too much in size.

Q. Either by design or by omission you have not given any figure for engine size. How big an engine can you test?

A. I am not free to divulge the size of the supersonic engines now being developed. However we did develop and flight test a 48″ diameter subsonic engine. A supersonic engine of this size might well be capable of developing 200,000 hp.

Q. How about your plans for your test facility? Is it about completed?

A. Test facilities never seem to be completed in this business. We now have six test cells in operation, not counting air turbine test cells and fuel system flow benches.

We have a facility today which will nicely handle our present projects; however, in looking forward to the future, we know that many aspects will have to be improved to handle tomorrow's projects.

Incidentally, we are very proud of the small amount of money which we have spent on this facility. Much of it has been created from surplus equipment. I think often that we have put more invention into the test facility than into our products.

Q. What about commercial applications for some of these engines?

A. We expect that our afterburners may see commercial service first, although we are confident that ramjets will be used commercially at some time in the future.

Q. What is the possibility of a quiet afterburner?

A. I doubt that we will ever have what the public will call a "quiet" afterburner, and I would imagine that large commercial aircraft using afterburners will need to operate from somewhat remote airports served by helicopters.

However, much can be done to reduce the noise level of present designs. A large part of the present noise, especially the low frequency components which carry for long distances and cause objectionable resonance in surface structures, is due to the roughness of combustion. Combustion actually is an explosion process which must be accompanied by some noise; however, the frequency can be increased and the noise level reduced by creating a multitude of microscopic explosions in the burner.

Q. Isn't it true that much of the noise occurs in the high velocity jet down-stream of the afterburner? Can anything be done about this?

A. That is certainly true. The jet breaks down into large-scale swirling which causes noise. For ground operation this can be and has been controlled very effectively through the use of large silencers. This, of course, is completely impractical for flight, so that the only approach to this problem is to reduce the jet velocity.

Unfortunately, this also means that the pressure level in the afterburner is being reduced, reducing efficiency. It should be possible to produce a relatively quiet afterburner for a by-pass engine, due to the lower pressure ratios and jet velocities for this type of powerplant.

Q. I have seen comments attributed to you regarding catapulted take-offs for ramjet-powered transports in the future. Would you elaborate on that?

A. The ramjet is an ideal supersonic cruising powerplant. For commercial applications rockets and turbojets are both expensive boosters. Also, the high g's produced by the more desirable rocket installation will not be satisfactory for passenger service. I believe that the best solution to this problem will be to install large catapults in at least all of the major cities of the world, with JATO still available to take off from emergency fields.

The ramjet powered transport would have fairly large wings for flight at enormous altitudes. This, combined with its very low weight empty, should permit landings on very small runways, offsetting a sizeable part of the cost of the catapults.

Q. When do you feel the state of the art in the ramjet field might permit this to take place?

A. We are ready to do the job today. Timing depends upon when the public will pay for supersonic flight. Perhaps if the argument about turboprops vs. turbojets for commercial airliners continues for another five to ten years, we'll beat them yet. • • •

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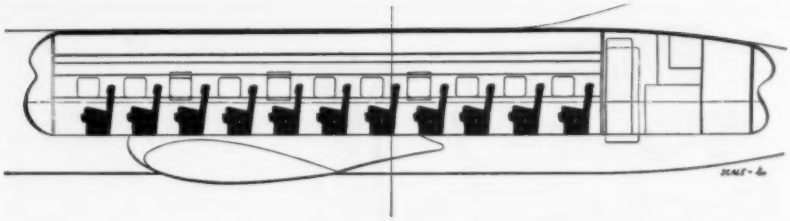
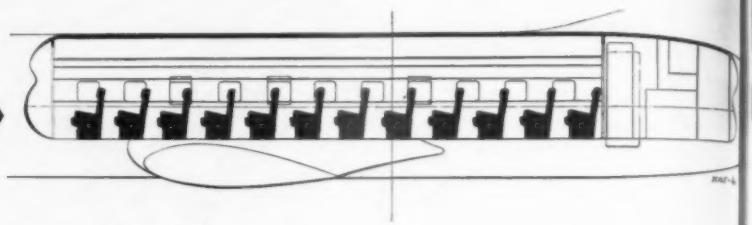
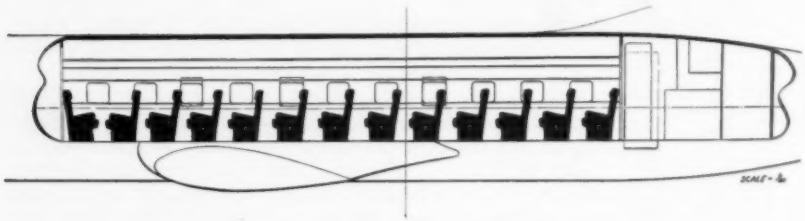


STANDARD first class seating in Convair 340 offers 44 forward-facing seats with 38" spacing between them.

POPULAR FOREIGN PATTERN shows 48 forward-facing seats in Convair-Liner with 34 9/16" spacing between.





IN KIT FORM from Convair is 52-passenger configuration with one row of aft-facing seats and 34" spacing.

Convair Refines the 340

CONVAIR is now moving ahead on its program to add approximately 15 mph to the cruising speed of the Convair-Liner 340 by reductions in airframe drag.

The company has been impatient to get this project started, but hasn't been able to clear it into the experimental shop. Latter is tied up by the company's big military work load, and Convair, naturally, wants to avoid undertaking the job in production.

To surmount this complication, the San Diego manufacturer has completed arrangements to have the work performed at the aircraft division of Lear, Inc., at Santa Monica, where it will be supervised by Ben O. Howard, the company's consultant on transport design, and Gordon Israel, chief engineer for Learcraft.

The project is pretty well mapped out and will include a variety of design refinements, such as improving engine cooling drag, a makeover which may involve re-shaping the back end of the nacelle; streamlining of the wing fillet; cleaning up aileron surface flow; and a general refining of openings, projections, antennae, etc.

F. W. Fink, chief engineer of the San Diego division, estimates it will take approximately 90 days to complete the work at Santa Monica. Following this Convair will prepare to make kits available to incorporate the design refinements in the 340's now flying.

Although the 340 has met its performance guarantees, including the provision for an average cruising speed within two per cent of 284 miles per hour at 20,000 feet with 1200 bhp per engine and a demonstration weight of 45,000 pounds, Convair has been anxious to get going on the improvement project both to provide better performance for airline purchasers and to make the bigger 340 faster than its predecessor, the 40-passenger Convair 240. At present the difference is about eight mph in favor of the 240.

In addition to faster cruise, the design refinements also will provide further performance improvement by enabling Convair to reduce the stalling speed somewhat and get an increase in gross weight. Extent will be determined by tests during the program.

The 340 currently is certificated for 47,000 pounds, using P & W CB16 engines. Performance data for 48,000 pounds, using CB17 engines, was obtained during the original CAA certification tests, but the paperwork never was completed, owing to lack of interest on the part of airline customers in the higher octane fuel required for the CB17 engines.

Convair also is moving along in its campaign to reduce cabin noise by installing engine exhaust silencers. Flight service tests have been completed on two types of silencers, one made by Maxim, the other by Industrial Sound Control Corp. Reports have been distributed among the airlines for recommendation and Convair is now awaiting results.

European and other foreign carriers are practically unanimous in turning to the higher passenger capacities Convair is now making available through kits for seat tracks and removable seats.

Through the use of these kits, seating capacity can be increased from the standard 44 seats to either 48 or 52 seats. The 48-seat configuration is the more popular and Convair, as of a recent date, had received orders for 72 sets of these kits. Only one U. S. carrier, Continental Air Lines, has ordered them.

Convair has done considerable experimenting in higher densities for the 340 and at one time contemplated moving the bulkhead to go up to 56 seats. This, however, would have cut into luggage and coat space and into the cubic space European carriers need for the money box and the liquor and cigaret cabinets which they carry.

A 48-passenger configuration adds approximately 200 pounds to the empty weight of the 340. A kit weighs approximately 300 pounds, but about 100 pounds of a standard seat installation is taken out, leaving a net of 200. Kit cost is $5,280. Its estimated installation requires 400 man-hours.

Seat tracks are made by the Brown Line Corp. and the seats by Hardman Tool and Engineering Co. • • •

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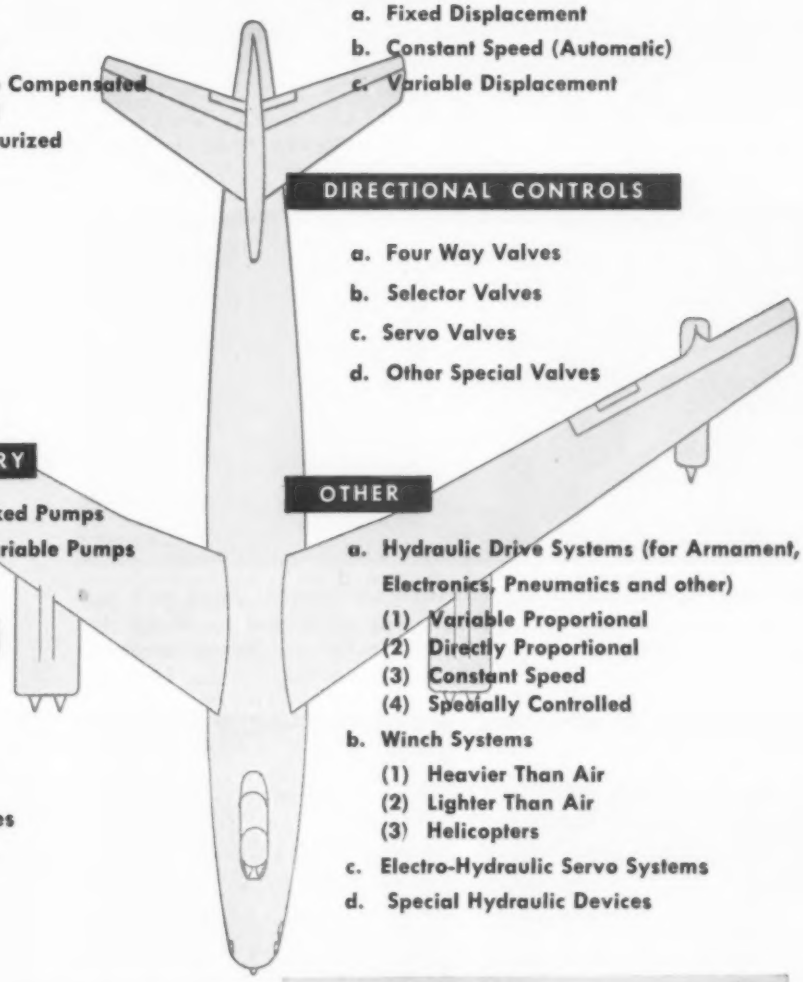

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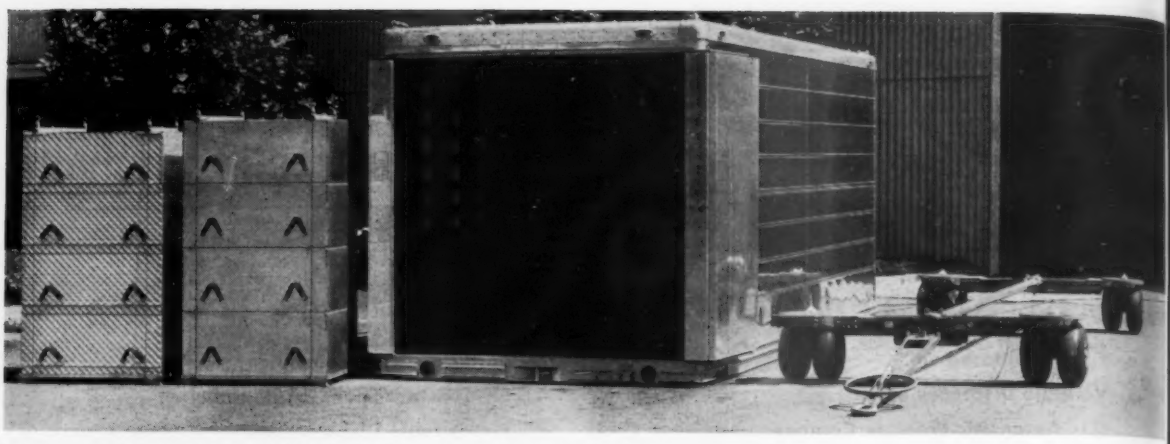
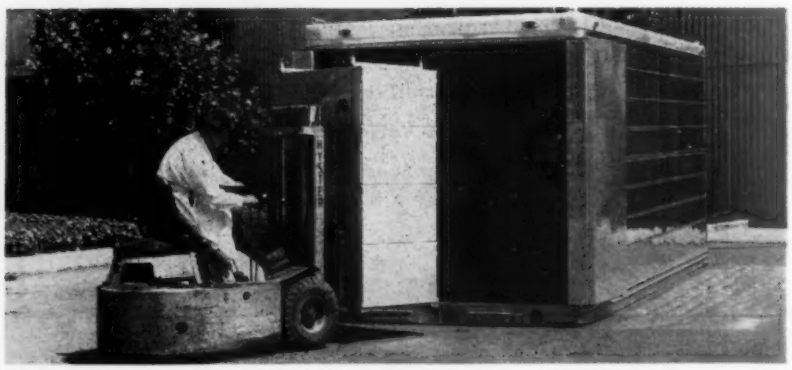
ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921



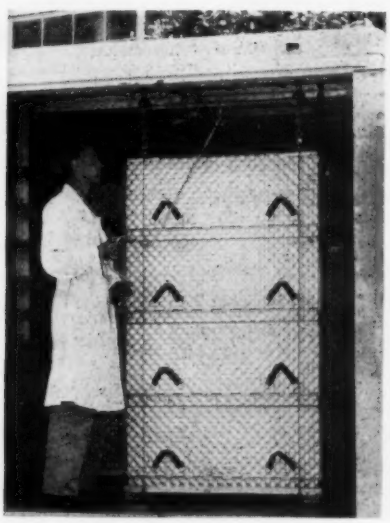
Now undergoing USAF evaluation, Air Transit Van equipment shown above was designed and built by Transit Van Corp. of Redwood City, Calif. Eight units are in service with USAF in Tokyo, four at Kelly AFB, Texas, in inter-depot use.



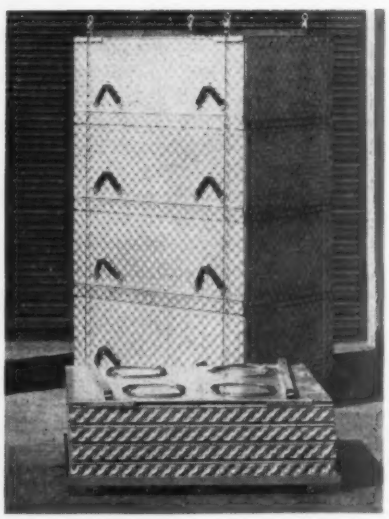
Aluminum honeycomb containers are shown in "ground level" loading of van, using fork lift. Built-in hydraulic system extends and retracts leg rams. Pressure reading permits ready computation of van load and balance information.

Transit Vans

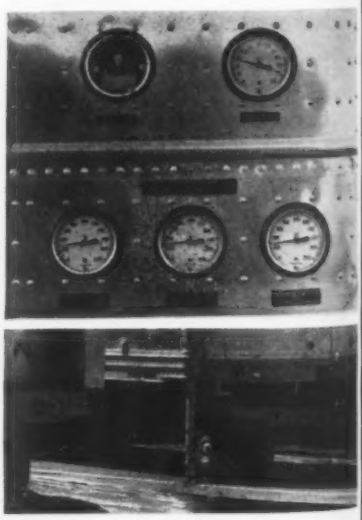
Answer for Air Freight?



Built-in overhead crane moves stack of "All Stresst" containers into position in van. Program calls for evaluation of unit loading in Douglas C-124A's.

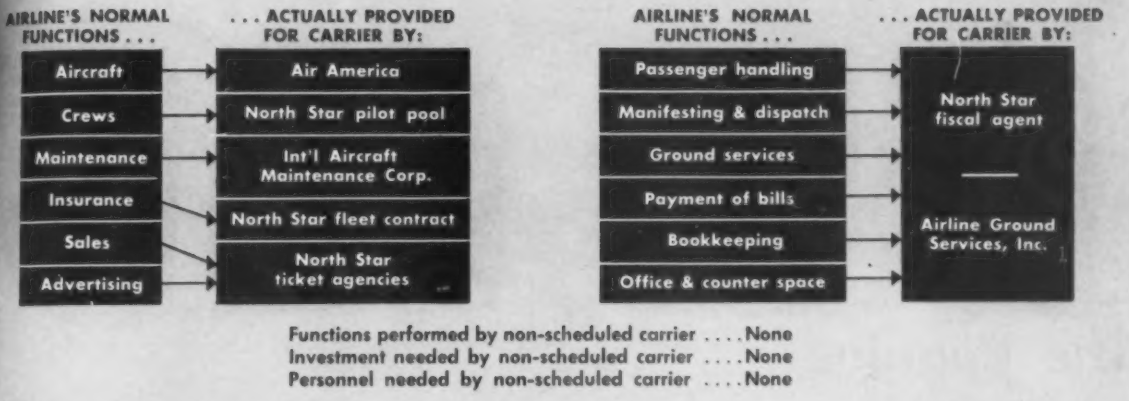


"All-Stresst" containers specially designed by Transit Van Corp. for AF test, can be completely collapsed. Units measure 42" x 32" x 17" deep.



Side-mounted hydraulic pressure gauges (top), used with conversion chart, permit quick load computation. Hydraulic leg rams (bottom) allow quick removal of special magnesium gear.

Q.: What does a non-scheduled carrier furnish when "operating" in a combine?
A.: Its letter of registration.*



Functions performed by non-scheduled carrier . . . . None
Investment needed by non-scheduled carrier . . . . None
Personnel needed by non-scheduled carrier . . . . None

* Based on record in Docket No. 5132 re Paul Mantz Air Services operations in North Star combine.

CAB Streamlines Non-Scheduled Hearings

Case could go on forever at present rate; after two years, only half the applicants have been heard.

By William V. Henzey

AFTER TWO YEARS and 28,000 pages of transcript, CAB has decided to "sharpen the issues" in the omnibus Large Irregular Air Carrier Investigation.

Immediate aim, the Board says, is to determine the future role of the non-scheduled lines without getting bogged down further in the voluminous detail associated with each individual carrier's presentation.

To date only half of the 60 non-scheduled applicants have been heard. Because it will be about three years between presentation of the last applicant and that of the first, it is conceivable that the early applicants will want to be heard again to freshen their cases with more up-to-date information. Thus, CAB concludes, the case could go on forever at its present pace.

Instead, the agency feels a "representative cross-section of the irregular carrier" industry has been heard, thereby permitting an expedited ruling on general public interest phases of the case.

Since hearings first started sessions have been held in Washington, Miami, and Los Angeles. They were scheduled to resume early this month in Los Angeles, but the new CAB thinking may change or, at least, delay such resumption.

During the last four months of the Los Angeles hearings, the case moved very slowly, but was productive of what the scheduled airline intervenors considered "damaging evidence" relating to the "fitness and ability" of numerous non-scheduled applicants.

Chief among such evidence was that relating to "renting out" of letters of registration and activities of so-called "combines." CAB rules prohibit transfer of letters and combined operations which result in excessive services.

Six in Combines

At least six carriers at the west coast hearings furnished testimony indicating they entered agreements whereby their "letters" (or licenses) were used by a "combine" for a certain consideration. The actual holder of the letter needed no aircraft, personnel, capital, etc.

Paul Mantz, who entered an agreement (see diagram above) with the North Star "combine," testified he did so "so that I could operate my certificate without all the headaches involved with finances, paper work, maintenance, insurance, aircraft acquisition, and so on."

Meanwhile, other phases of the Los Angeles hearings read like a detective novel. An official of one airline testified that it kept a "secret bank account" which couldn't be produced because it had been lost in a burglary.

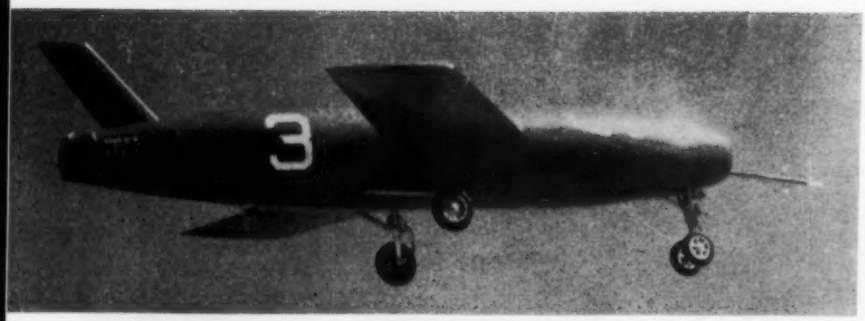
Another involved employment by one carrier of a young lady who used a fictitious name in signing company checks. This device helps in avoiding creditors.

Still another episode concerned one "combine's" offer to pay Chicago police a "commission" for procuring passengers for its service. The proposal came to light when the printer of circulars distributed to 14,000 Chicago policemen rebelled because he could not collect his bill in full.

And there were instances, unreported heretofore, of "shadows" shadowing "shadows," of attorneys questioning mere observers at the hearings, and deep intrigue generally out of proportion to the scope of the proceeding being conducted by a quasi-judicial body.

It was thus the Board's Republican majority—Chairman Gurney, Vice Chairman Denny, and Member Ryan voted to expedite the case by confining cases of 30 remaining applicants to issues of "general public interest." Board will then reach a decision, presumably tentative, on the future role of such carriers.

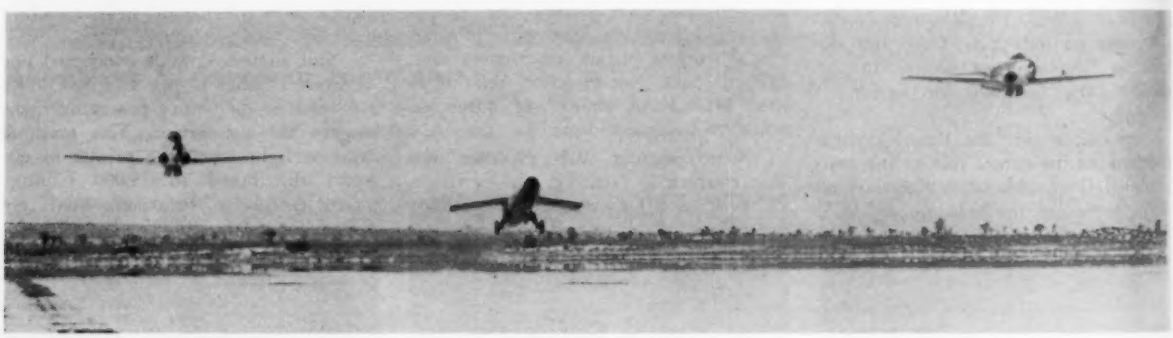
Thereafter, any of the 30 carriers that figure to continue in the role set by the Board may be heard on issues of fitness, etc. Democratic Members Lee and Adams dissented from this action, claiming that expedition can result only if the majority decides there is no role for irregular carriers. • • •



PROBE IN NOSE measures flight characteristics of Chance Vought Regulus, guided missile which can land on own gear after conclusion of flight.

The Regulus In Action

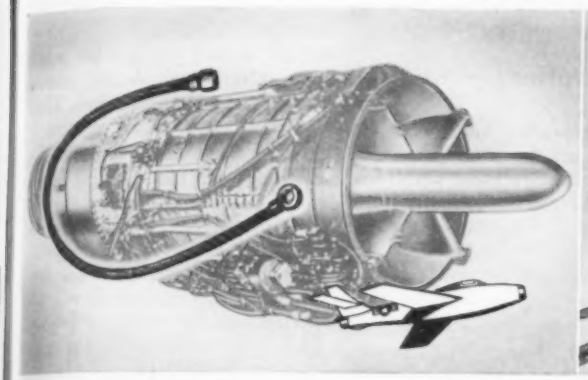
ON TAKE-OFF RUN a Regulus is guided by a single-seat TV-1 control plane flying above it. Combat version of the missile would have no wheels.



GEAR DOWN and flanked by photo plane and control plane, the Regulus comes in for a landing on the dry lakebed runway at Muroc. The missile can also be launched with rockets, making possible its use from submarines and surface ships as well as shore bases.

AFTER TOUCHING DOWN, the Regulus is slowed to a halt by a parachute released from the tail. Considerable savings are made possible by the fact that the missile can be recovered after trial flights. Submarine Tunny has been modified to launch the Regulus.

Four design ideas you can use right now...



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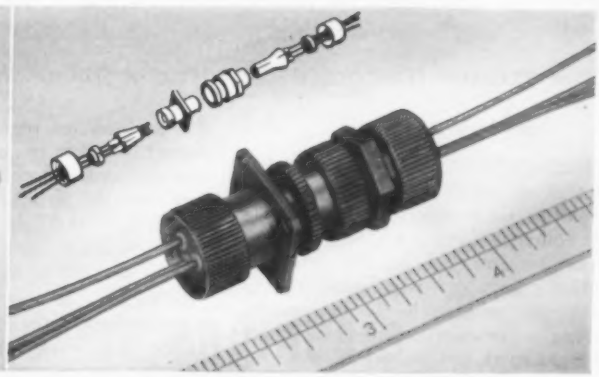

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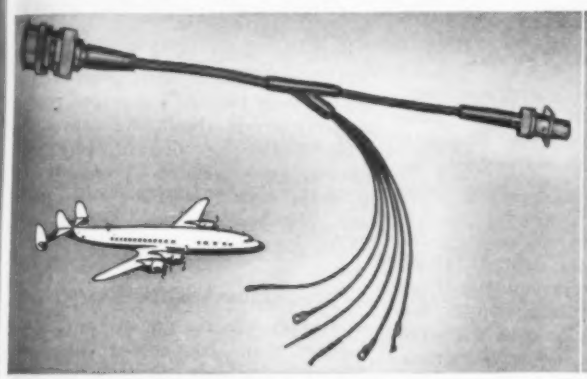

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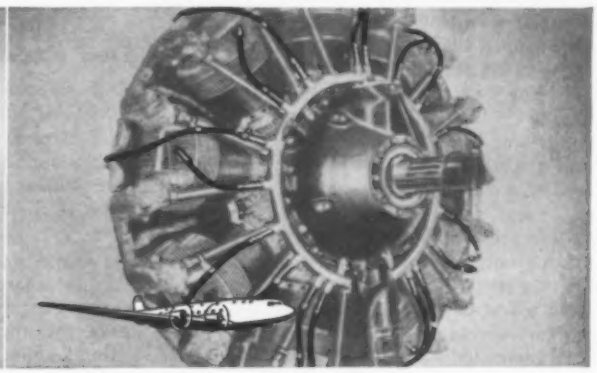

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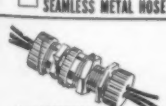

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Has Canada Solved the Airport Fee Problem?

Northern neighbor has standardized rates, but needs greater traffic density to make them work.

By Lois C. Philmus

THE INDUSTRY is fast realizing that a vital link in continued growth of air transport is the profitable and equitable operation of the nation's airport system. High on the agenda of problems facing airport authorities is the proper solution to the problem of finding a common medium for establishing airport use charges.

A formula is being sought for providing some sort of standardized landing fees as one of the major answers.

Recently the New York State Bureau of Aviation released a summary of its surveys on the types and levels of landing fees employed at airports within the United States. The survey found that of 136 scheduled airline airports responding, 151 systems of fees for scheduled flights were submitted. Seventy-nine fee systems were reported by 64 airports for non-scheduled flights.

The survey points out that "until very recent years, an airport manager was concerned almost exclusively with inducing airlines to serve his station, with the result that landing fees represented token payments as often as not. In many cases, because of long term leases negotiated under these conditions, such token fees are still in effect."

Of the many systems used, the one gaining particular industry favor is the use of weight of planes actually landing instead of the number of scheduled landings as the basic determinant of landing fees. The weight system, in most cases, has represented a departure from charging for flights scheduled.

"There is a strong argument in favor of basing weight charges on flights scheduled," the survey observes, "for facilities for the landing must be readied, whether or not the landing is consummated. On the other hand, airlines feel the airports should logically bear part of the cost of the uncertainties of weather, etc., in what has become a venture of mutual interest."

"Ideally, landing fees should be compensatory," the report concludes, "They should enable the airport to meet the cost of landings and to realize a reasonable profit on this phase of its program. However, from either the competitive or 'public service' standpoint, rates established should not be too far 'out of line' from those in force at other stations."

How Canada Does It

With the problem stated, it is interesting to consider how Canada is working out its airport revenue situations, since methods applied and problems involved are almost 180° away from those in the U. S.

The U. S. has adequate traffic density to make some form of standardized airport charges equitable. Canada has the standardized charges, but lacks sufficient traffic to show the profit needed. But because of the charge system, Canada is perhaps closer to the break-even point when traffic is increased.

Operating costs at Canadian airports are relatively higher than in the U. S. because of longer winters, leading to higher winter maintenance. Lack of high traffic density also makes costs higher. Yearly traffic at each of its two largest airports—Montreal and Toronto—amounts to only about 28,000 aircraft movements and 600,000 in and out passengers annually.

But all airport charges are standardized to a very high degree, particularly in the case of landing fees. There is one level of rates for all airports.

This has been made possible to a great extent by the fact that the majority of the fields are operated by the federal government's Department of Transport. Of about 300 civilian airports, about 115 are federally operated, 100 are run by municipalities, and about 35 are run by airlines. Provincial air services and the department of mines each operate about 25.

Because of higher operating costs and light traffic, higher user rates must obviously be charged in Canada if the airport manager is to recover his operating costs.

Here's how the Canadian system of landing fees works: Gross weight of aircraft is taken as a basis. Landing fees increase faster than gross weight, because unit rate for a thousand pounds of gross weight climbs five steps up, as follows: 10¢ for aircraft over 15,000 pounds gross weight; 12½¢ over 30,000; 15¢ over 45,000; 20¢ over 75,000; and 25¢ for all gross weights over 75,000 pounds.

Trans-Atlantic Rates

Trans-Atlantic rates are much higher than continental, since the former includes charges for navigational facilities. As an example, a DC-6 at a gross weight of 83,200 pounds pays a continental rate of $23.70 and a trans-Atlantic landing fee of $128.50.

The New York State survey shows that, even employing the varied systems of charges in the U. S., the average or typical landing fee for a DC-6 rated at 75,000 pounds would be about $6.75.

A rough figure of about $170,000 in annual revenues is figured as the break-even point at Canadian airports. This would be considerably higher in the U. S. for several reasons. Higher traffic density creates the need for larger airports, with considerably larger investments than will be found across the border.

While landing fees vary widely in the U. S., terminal facilities and hangar rentals vary even more. Again Canada has standardized to a large extent. Where Canadian landing fees are higher than in the U. S., its rentals for terminal and hangar facilities are lower. Since September 1, Canadian fees were set at $4.00 per square foot at major airport terminal buildings, and $3.00 per square foot at less important

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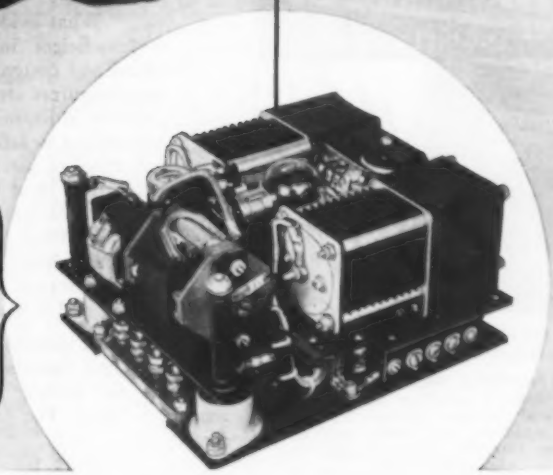

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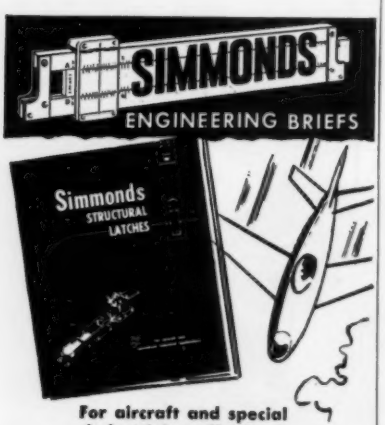
Canada's federal hangar rate is 60¢ per square foot annually, with all services provided. When a tenant takes less than one-quarter of a hangar, the rental goes up 25%. When a carrier takes over the hangar operation, rental goes down to 20¢ per square foot. To encourage ownership and operation of hangars by airlines, an incentive of one cent per square foot annually for hangar sites is allowed on an average for a long term lease.

Industry feeling is that it may take Canada longer to achieve overall profitable operation, but when it does come about it may be more stable than in the U. S.

In analyzing the two systems of charges, a glimmer of an answer may be observed. By careful study of the good and the bad methods used by both countries, the U. S. could well profit by the Canadian method of standardized charges. It has the traffic density to make it work.

Complete standardization will be impossible for years to come, but the Canadian attitude on rental charges could well be encouraged in this country, scaled up, of course, to include the higher investments made in U. S. facilities. • • •



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Extra Section

By Lois C. Philmus

WE HAVE BEEN READING with interest—and considerable bewilderment—articles and editorials in a weekly trade publication that there are no reliable statistics, nor any attempt to compile reliable statistics, regarding the corporate aircraft group. Equally bewildered must be, not only the group itself, but the service organizations which count the corporate group as their chief customers.

For example, in its year-end report, the Port of New York Authority states that its four airports handled 70,095 corporate plane movements. Washington National Airport estimates 40 business aircraft land at the field per day. One large fixed-base operator states that its income from servicing corporate aircraft is nearing the million-dollar-per-year figure. Major modification centers throughout the country rely almost 100% on the corporate group for work and sales. Such companies as Remmert-Werner in St. Louis, Southwest Airmotive in Dallas, AiResearch in Los Angeles, Southern Aero in Atlanta and Piedmont in Winston-Salem are representative of such a group and cumulatively represent a multi-million dollar industry.

Accessory and equipment manufacturers have felt the impact of the group in increased sales of all sorts of navigational aids, radio equipment, engines and parts. Figures are a matter of record. At annual meetings of such organizations as Aviation Distributors & Manufacturers Assn. and National Aviation Trades Association, manufacturers' representatives, distributors, and operators all agreed in public meetings and in off-the-record discussions that the market is a formidable one. Just about all the aviation industry—with the exception of large companies involved in multi-million dollar military contracts—has geared operations to attract and encompass the corporate aircraft fleet. This is fact, not speculation.

What evidently has worried the editorial writers is that there is insufficient information to warrant some manufacturers going ahead and designing an aircraft to meet the needs of the group. The manufacturers are not worried about potential markets. Their biggest problem is financing prototypes, not making ultimate sales. But they are willing to talk. In the past year National Business Aircraft Assn. has tried to ascertain needs among its own group (which consists of nearly 250 of the largest corporate users operating nearly 400 aircraft in the multi-engine category, ranging from Beech D-18's to Convair 340's). The result was a majority opinion which has been well publicized. What has not been well publicized, perhaps, is the fact that several manufacturers are on the way to providing what is needed and it should be available within the next two or three years.

To boost things along, NBAA is organizing a liaison committee to negotiate with interested manufacturers. Just by working together and ironing out mutual problems and solving them together will the project be put under way. The market is there. The companies will discover that. In some instances they have already done so.

More figures? CAA in 1952 had recorded a registration of about 1700 multi-engine aircraft in service by business groups, ranging from Widgeons, to Twin-Beech's, to DC-3's. We would also like to point out that in the April 27, 1953, issue of AMERICAN AVIATION results of a four-month survey of the group were published. Working from a master list of over 5000 companies we received responses from 1024 users. Of the responding group, 177 companies were operating 280 multi-engine aircraft. The master grouping showed that 634 companies had 1295 multi-engine aircraft in service.

Inquiries received by us from various manufacturers prove the interest, negotiations will prove the needs, and when all the elements are sifted through—one, two, and maybe three companies will come forth with the design. Sooner, from all indications, than some will have you believe.

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Unused O.H.C.	*When we specify that a part or component is "UNUSED OVERHAULED CERTIFIED" it indicates the unit is in unused condition. However, due to long term storage it is necessary to replace seals, packings, bearings, etc. in order to return the unit to its oiginal new and air-worthy standard. We will provide CAA certification to this effect.*
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Edward Lund

President

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West Coast Talk

By Fred S. Hunter

What might American Airlines have netted had it gone to an extra fare—say $10—on its DC-7 nonstop schedules between Los Angeles and New York? A little simple arithmetic provides the answer. A 70% load factor (don't tell us we are being too optimistic!) comes to 42 passengers per plane, or 84 for a round-trip flight. At $10 a head, that's $840. Multiply by 365 days in the year, subtract 2% for weather, and you have an annual added revenue of $299,880 per round-trip. Counting in Washington and San Francisco possibilities, AA probably could schedule in half a dozen of these banner trips and ring up a total tune of something more than $1,500,000 a year.

It's generally conceded AA would have had little trouble supporting an extra fare charge. The speed, the comfort, the special services, it is pointed out, would have made the extraction of another 10 bucks from the customers practically painless. Certain revenue-conscious traffic men even argue that the snob appeal of an extra fare actually would boost ticket sales. Others discount this, contending it could not escape being tagged a nuisance charge, like luxury taxes, broker's fees for theater tickets, and tips to hat check concessionnaires. You might pay it without audible complaint, but you still wouldn't like it. Morever, they submit that while $1,500,000 in the hand ain't hay, it shrinks into insignificance in the long-range view. Of course, the competitive picture may have helped AA resist the temptation. The AA-TWA battle for business is going full blast, and United Air Lines will make it a three-way scramble after it gets its DC-7's.

•

Today's price tag on the Wright Turbo-Compound commercial engine is $74,300. Last boost was up from $72,600. It started out at $68,000. Total increase is only about 10%, but it indicates how equipment costs keep climbing. New higher military rating of 3700 hp for the Turbo-Compound power plant will eventually be reflected in a step upward in the present 3250 hp commercial rating. The 3700 hp military compound engines will go in Lockheed's P2V-7, due soon. It probably will be mid-1955 before the CA engines (DA for the Douglas version) which will show an increase of 100 hp for rated power, will start going into Douglas DC-7's and Lockheed Super Constellations.

•

Among aircraft designers' various small annoyances is their inability to find somebody who has a real good high-temperature paint for high speed craft. Paint makes slick surfaces, which would help push the Mach numbers higher if they would just stay slick. In one test not long ago a so-called heat resistant paint lasted a matter of eight seconds.

•

It's interesting to check off the flight time by equipment in Franklin Young's log. He was the first TWA pilot to retire at 60, the company's prescribed retirement age for flight personnel. Of 24,487 hours in his flight log, 22,680 were for TWA. He flew 5000 hours in Ford trimotors, one hour and 25 minutes in the experimental Douglas DC-1, 1514 hours in DC-2's, 11,197 hours in DC-3's, and 4969 hours in Lockheed Constellations.

•

Elevator used to carry mail to and from the roof of the Terminal Annex Post Office in Los Angeles broke down the other day and mail sacks began piling up on the roof as Los Angeles Airways kept bringing loads in from the airport. Gave **Clarence Belinn** another opportunity to go around boasting of the superior lift qualities of the helicopter.

•

WEST COAST MISCELLANY—Ryan Aeronautical Co. has more than doubled its engineering staff in the last year, from 200 to 450, reflecting increased experimental work and a wider range of activity . . . Tom Lanphier of Convair claims the new Tamarisk Golf Club at Palm Springs is the finest layout in the country. Of course, three 76's in a row may have had some small part in this evaluation . . .

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A Pilot Defends the Local Service Airlines

It's time for some decisions, says author, and creation of a double standard is not the answer.

By D. O. Lafferty

The following comments by Mr. Lafferty, a pilot for a local service airline, were inspired by news of a letter sent to the presidents of the local service airlines by the CAB (American Aviation, Jan. 4) suggesting means of reducing costs.

BY the Civil Aeronautics Board's own statement and implication the local service lines' existence is at best precarious, and subject to the vagaries of what is known in polite circles as the "Policy."

During the past year it has been impossible to read an aviation periodical which in some manner does not allude to the threatened demise of local service for one reason or another. This, of course, does nothing for morale that couldn't be accomplished easier with a hand grenade.

It is my opinion that the local service airlines have done an amazing job of operation in the face of every obstacle that could be placed in their path. That the cost is so low is a credit to good management.

The job was accomplished with predominantly DC-3 equipment, which the trunk airlines admit is impossible to operate at a profit. Aircraft now in existence, Convairs or Martins, could be used experimentally at a fraction of the cost involved in producing the prototype that even now the Board and the operators are unable to visualize in a practical program.

On the question of wages and productivity, I speak of the airline which is my employer and which is, in my opinion, representative.

Our employes work side by side with the employes of six major airlines. These airlines are established. They can afford, without criticism, and provide for their personnel pensions, medical care, insurance, and hospitalization. Most of all they provide a future in which an employe may better his lot or mark time as he chooses.

An executive can look to progress in his career and higher income. Given the ability he may, for himself and his family, establish security. The years devoted to his employer are not at the pleasure of "CAB Policy," but in the hands of an established administration of hard headed businessmen.

With the exception of the older pilots there is not one of our employes who could not at least equal his present income by accepting employment with one of these carriers. Many of our people use our company as a stepping stone to gain such employment, but the majority stick around, their confidence uncompromised.

How are you going to ask these people to take a pay cut? It is implied that there should be two standards. The locals should get along with second class executives, mechanics, dispatchers, pilots, etc., and pay them accordingly. If such thinking could be instituted (which is doubtful), it would be difficult to find enough second class personnel in aviation to operate a Curtis Pusher across the airport.

Worker Productivity

What about "increased worker productivity?" Our management is expert at the assignment of "collateral duty." For example, the title "Station Manager" carries with it responsibilities ranging from explaining to the local Chamber of Commerce why "X" flight was 12 minutes late on the day of the big storm to sweeping out the terminal a couple of times a day.

He has help of course. Agents, they are called. They are agents in fact as well as by implication. In addition to selling tickets and handling reservations they are charged with operation of the radios, refueling and servicing of flights, weather observation and reporting, loading, unloading, and loss of baggage, finding of baggage and alibis therefor, board and room of pets whose owners find it inconvenient to drive out to the airport until next Monday, and in many cases they act as unofficial tower operators.

Sounds like quite a staff. It isn't. The average is a fraction over three people per station.

There is little to be said in respect to maintenance. If it is good (and ours is the best) it follows that the mechanics are producing. If it is poor they must still produce. All you can ask is: how many does it take? A stranger in our hangar would be unable to distinguish the Chiefs from the Indians. They are all busy producing, and in coveralls.

They produce to my satisfaction. If the airplane doesn't work I don't fly it, and I have never had a flight cancelled for mechanical reasons. I'd hate to see any of those second class people in this department. So would the passengers.

Our vp-operations earns about what a DC-6 co-pilot is paid. He works seven days a week and when in town is immediately available from the first morning take-off to the final night landing. He is producing for sure.

I have, with the exception of one year, helped negotiate every pilot agreement we've signed with the company. I have found him chary, to say the least, with funds for pilots. As a matter of fact the paragraph titled "Wages and Salaries" is almost word for word what we first heard six years ago and it was at that time a local product.

As long as we operate the DC-3, material, repair, and overhaul costs will continue upward. The entire cost system is predicated on a war surplus market. It used to be cheaper to buy a new R-1830 engine than it was to overhaul it. The same was true of many components.

This source has, as all operators know, been drying up at a fast clip and prices are spiraling at a commensurate rate. You can form purchasing syndicates daily and the simple economic law of scarcity will continue to govern.

Landing fees and rental are of course a different cost at each airport and subject to negotiation. We could easily bring those costs *up* to the level paid at our major terminals, but I doubt if the procedure could be reversed. Here, however, a reduction in rates could be enforced if the CAB could get the CAA to condition Federal airport aid on reduced rentals and lower landing fees for local service airlines.

There naturally might be some resistance to such a plan.

If the thing is so hopeless why stay with it? We would like to be around when every fatuous word that has been written about our efforts is prerequisite diet for the authors.

We were led to believe that if this experiment indicated eventual success, it would then be established as a permanent segment of the aviation industry. We like to think that we are doing our part.

The picture, if you believe all you hear and read, is very black. We don't believe that. We believe that if the CAB will recognize and rectify its earlier miscalculations it can very shortly terminate our experimental status. It is time for some decisions which reflect something more than year-to-year expediency.

Eight years is quite a term for such an experiment: something should have been learned in that time. • • •

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He's an American. He goes by air, on business and for pleasure; knows most of the airlines and their aircraft. *Watch that Passenger . . .* Something has happened to him. Recently in Europe he enjoyed an entirely new flying experience — the Viscount. Never had he stepped off a plane feeling so fresh. Never had he flown in a cabin so quiet or so free from vibration. *Watch that Passenger . . .* Now he's home he expects equivalent comfort — and that means turbo-prop Viscounts.

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Letters

Continued from p. 4

of "Local Lines Shaken by CAB Comments," which headlines Mr. Henzey's article.

We in aviation must do everything in our power toward the proper development of the industry. Certain ones are in a better position to perform certain phases of that work than others. In our endeavour to help we must not be so clumsy that we trample on and destroy even better work of others.

A characteristic of all individuals is that occasionally we all make mistakes. I certainly believe that in this instance you have done Mr. Adams an injustice and the industry a disservice in both your reporting and in your editorial comments.

LEE LAMAR
Chief, Aviation Section
Missouri Division of Resources and Development
Jefferson City, Mo.

WANTS CORRESPONDENT

To The Editor:

I am writing to ask whether you could help me make contact with AMERICAN AVIATION enthusiasts who could correspond with me in German. I am extremely interested in all aviation matters and have done a certain amount of design work. During the war I was chief radio operator on one of our 57-ton Tiger tanks, fighting the Russians.

MATHIAS BRAND
Hauptstrasse 5A
Ueckesdorf, Bonn
Western Germany

CORPORATE FLYING

To the Editor:

We were very pleased to read Lois Philmus' excellent article on the 'Ideal' Corporate Aircraft in the November 23 issue. AMERICAN AVIATION's increasing interest in corporate flying is a true reflection of the tremendous growth of this important segment of the industry.

May we add to Miss Philmus' commentary one very important statement made by George Page, chief engineer of Aeronca. Mr. Page stated that it would take a minimum of 30 months and probably three years to get out the first airplane, assuming they had sufficient firm orders and deposits to start work immediately. Meanwhile, within this three years, Lear, Incorporated, will have turned out 40 to 50 LearStar Conversions whose operation and maintenance characteristics are much closer to the 'ideal' corporate aircraft design than perhaps some people would like to admit.

For example, the LearStar Conversion is guaranteed to cruise better than 270 mph at 10,000 foot altitude with approximately 95 gallons fuel consumption per hour. This, with a range close to 3000 miles and a cost per airplane mile of 34 cents to 45 cents, depending upon utilization.

The airplane will carry 10 people, and with a luxury equal to that found in airplanes many times the size and gross weight.

The LearStar Conversion in its present configuration falls but one step short of the 'ideal' design by not being pressurized, but this is not at all impossible and design studies are already under way.

What is most noteworthy about all this is the fact that the LearStar Conversion was developed from the Lodestar with company money and without a single deposit to bolster the enthusiasm. Lear has done this with the conviction that a market exists today for an airplane in the LearStar class and that in today's competitive market, the company to receive this corporate business will be the one to get there "fustest with the mostest." That is why we have coined the following keynote slogan:

No twin-engine airplane flying today can carry . . . as *many* people . . . as *fast* . . . as *far* . . . as *comfortably* . . . as *quietly* . . . as *economically* . . . into as many airports . . . with as little maintenance . . . as the LEARSTAR CONVERSION . . . *regardless of price!*

ELMER R. EASTON
Sales Manager,
Western District
Lear, Incorporated
Aircraft Service Division
3171 S. Bundy Drive
Los Angeles 34, Calif.

RANG THE BELL

To the Editor:

I just turned over the last page of the December 21 issue, reluctantly!

First, I really like the lead editorial and I agree wholeheartedly with your last paragraph. Union and management must come to understand that they're both on the same team. Once they learn mutual respect they're on a winning team.

Second, I've always been an avid reader of "En Route." Having seen and lived in many of the places in Europe which you mentioned, I've always enjoyed it immensely. This time though you really rang the bell with your motor trip through the cantons of Zurich, Thurgau, St. Gallen, Appenzell, Schwyz, Uri and Zug. Have stayed at the Dolder Hotel and the Bauer au Lac. Played some of my first golf on the Dolder course in the spring of the year Lindbergh flew to Paris. Do they still have the course?

Between Stein am Rhein and Konstanz you passed through Steckborn, where I was at school for two years. Incidentally, along there you were following the shore of what's known locally as the Untersee. From Konstanz on, the lake is known locally as the Bodensee, and just across from where you were is famous Freidrickschafen. . . .

I could go on and on. Thanks for a very pleasant interlude.

THOMAS B. DOE, JR.
Manager,
Aircraft Products Sales
Vickers, Inc.
1400 Oakman Boulevard
Detroit 32, Michigan

Books

HELICOPTER OPERATION AND DESIGN REQUIREMENTS

Published by the International Air Transport Association, Montreal 3, P.Q., Canada. $6.00 (U.S.).

This report is based on the verbatim transcript of the IATA helicopter symposium held at San Juan, Puerto Rico, last April (AMERICAN AVIATION, May 11, 1953). It constitutes the most complete and up-to-date record of what is now known and what can reasonably be predicted for the next few years of helicopter operation and development.

Since the symposium it has become increasingly evident that the extent to which regular commercial helicopter services can be put into operation, and the speed with which they develop, will depend greatly on the awareness and foresight of municipal authorities, city planners and the like. The IATA report is probably the most helpful source material which it is possible for them to have.

The 183-page report discusses all phases of helicopter operation and design requirements, pointing up in particular the practical problems which must be overcome before the rotorcraft becomes an acceptable vehicle to the majority of operators. It also gives a revealing insight into the operations of those few carriers who are currently pioneering the commercial use of helicopters on both sides of the Atlantic.

. . . AV

WHITE'S AIR DIRECTORY OF NEW ZEALAND.

Vol. 6. 152 pp. Whites Aviation Ltd., Dilworth Building, Auckland, N. Z. Price 10/6d. ($1.47)

This is the 1953-54 edition of an unusually complete directory of aviation, inclusive of everything in New Zealand and the South Pacific. It also contains a Who's Who for the area, a history, list of airports, and all pertinent government information. . . . WWP

FAMOUS AIRPORTS OF THE WORLD.

By Ansel Edward Talbert. Random House, New York. 94 pp. $1.75.

For the nation's youthful audience, Ed Talbert, who is aviation editor of the *New York Herald Tribune*, has provided a very fine and informative book on some of the world's best airports. Lt. Gen. J. H. Doolittle, USAF Res., has written a foreword, and Clayton Knight has performed in customary top style with excellent drawings. Airports described are Idlewild, Pittsburgh, Thule, Muroc, Wake, London, Schiphol, and Tempelhof, with brief mentions of numerous other fields known for certain outstanding features or characteristics.

. . . WWP

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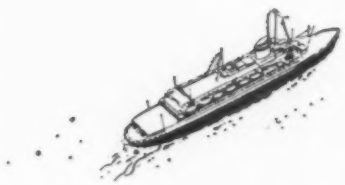
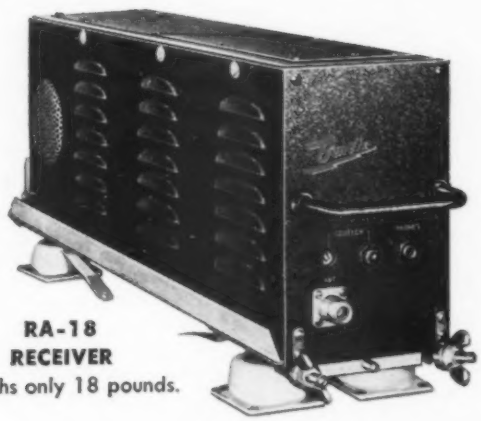


VHF COMMUNICATIONS



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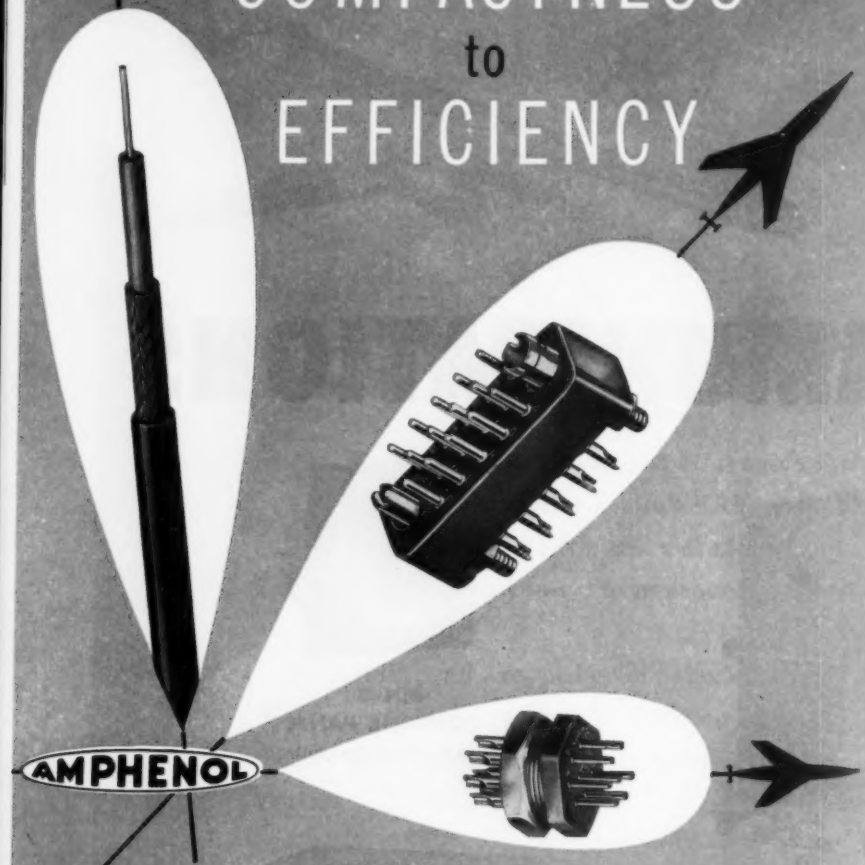

AMPHENOL

American aircraft manufacturers today build planes that have capabilities thought impossible just a few years ago. A large part of their success has been due to the inclusion of more and better electronic equipment in each new model. But, the use of this additional equipment has created new problems for aircraft designers, particularly those of space and weight.

One answer to these difficulties is the miniaturization of electronic equipment, and working on the components for this have been the engineers of AMPHENOL. From their engineering skill have evolved many of the new components needed to add *compactness* to *efficiency*—AMPHENOL miniature connectors and cables included in new compact electronic assemblies have helped solve many of the problems created by the trend toward miniaturization.

AMPHENOL is the world's largest *single source* manufacturer of approved A N connectors, R F connectors and coaxial cable. At your service to assist you with applications of these components is the AMPHENOL Engineering Counseling Service, who will also work with you in the modification of AMPHENOL components or the design of totally new units to your specifications.

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DIAMOND-SHAPED centerline pattern distinguishes Arcata, Calif., test runway.

New Runway Markings On Test at Arcata

A new runway marking system has been under study at Arcata Airport, Humboldt County, Calif. Designed by W. H. Levings, director of the county's department of aviation, the system is said to provide maximum guidance under restricted visibility.

The Arcata system's major feature is the diamond centerline. This figure was selected, according to Levings, as being the best adapted to furnish sufficient body surface and, at the same time, offer marked contrast with runway surface and other components of the system. Levings contends that the diamond-shaped marker will more readily attract and hold the attention of the human eye than a broken rectangular stripe, solid line, or other types of figures.

Edge markers of the system are identical to those set forth in TSO-NIOA, and which Levings feels properly fill the needs for longitudinal guidance along the runway edge.

Five Bars at Threshold

Five bars, occupying a painted surface of 15,000 square feet, have been selected as threshold marking. Although distance between bars should never be less than 10 feet, they can be diminished slightly in width to accommodate runways less than 150 feet wide.

In a pilot survey of the system, cross bars used to denote runway length received mixed reaction and could be eliminated in future installations. Remainder of system components includes marking boundaries of normal landing zone area as well as distance traversed and distance remaining to be traversed on runway of any given length.

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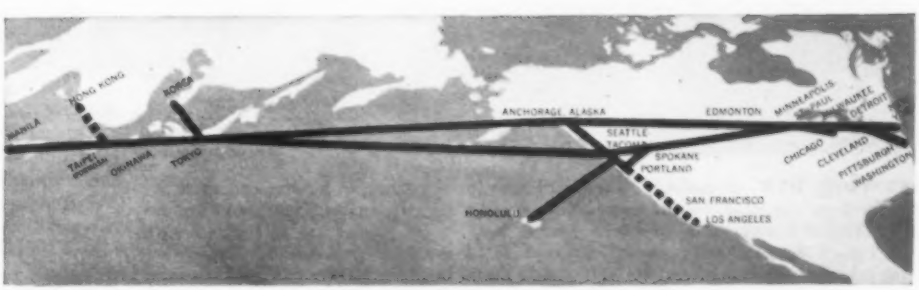
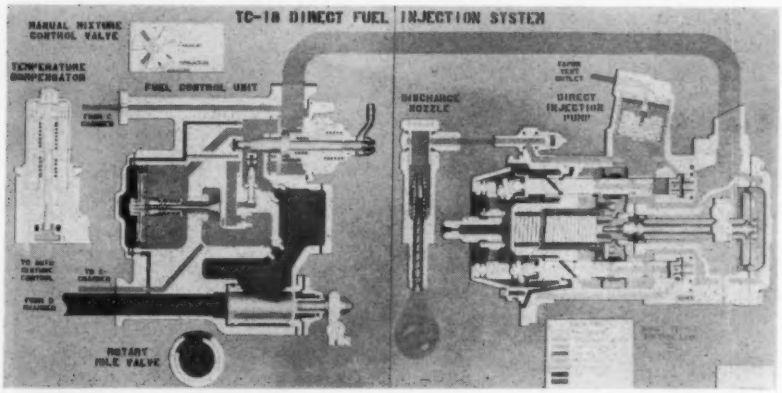


Maintenance Bulletin Board



ANIMATED TRAINING PANELS can be set to simulate various conditions.

Variety of Devices Speeds Training

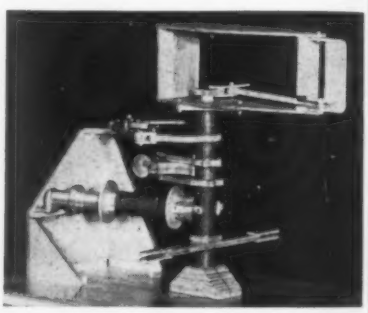
With the ever-increasing complexity of modern transport aircraft, the task of training airline mechanics is outgrowing the instructor-blackboard mode of teaching. Just as electronic flight simulators and navigational trainers have established their position in the field of pilot training, a whole new series of maintenance training aids have come into being.

One of the better examples of the extent to which some airlines have adopted these new tools is the program at American Airlines to prepare for the introduction of the Douglas DC-7 into service. Over and above the usual wall charts and slide projections, which are still considered the best means of explaining the basic facts of system operation and location of major components, the AA program calls for:

• **Animated Training Panels:** These are being used where system complexity calls for more detailed description than is offered by charts and slides. The animated aid shows the location of all seals, internal parts, and adjustment points in each component. Component parts can be moved by the instructor and students to simulate a variety of system operating conditions. In its DC-7 program American uses this type of panel to teach operation of the engine induction system and the propeller control circuit.

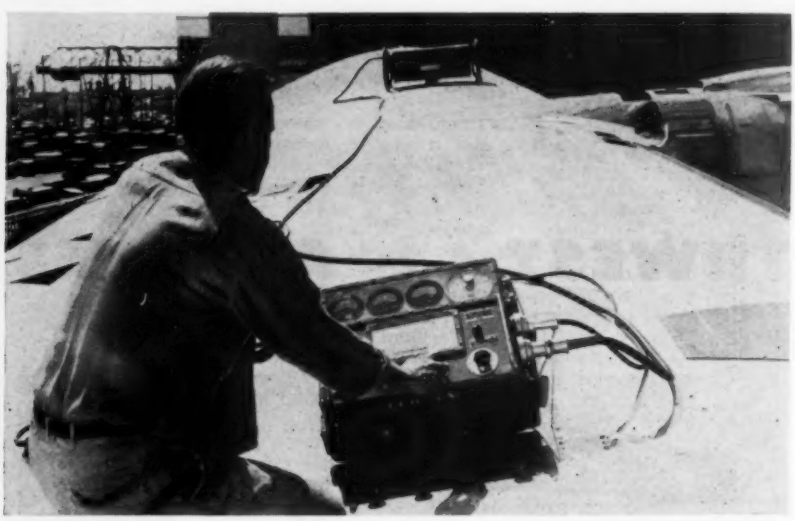
• **Operating Mockups:** Where system operation involves movement in three directions, three-dimensional mock-ups have been adopted to insure more rapid understanding of complex linkages and mechanisms. This type of unit is used by AA for training on the DC-7 aileron cross, rudder, and elevator operation.

• **Actual Aircraft Components:** For detailed instruction on the Wright Turbo-Compound engine, which was completely new to AA's operation, the airline allocated four of its spare engines to the training program. The engines were delivered well in advance of the first DC-7, were mounted on special stands at a cost of approximately $1000, and located at major training centers at New York, Chicago, Ft. Worth, and Los Angeles. Principal instruction subjects using the actual engines include cylinder change procedures, magneto replacement and timing, and fuel injection system operation.



MODEL OF RUDDER helps train American Airlines mechanics on DC-7. Operating mock-ups like this one are used to explain workings of complex systems.

The animated aids and 3-D mock-ups are built to AA requirements by Technical Training Aids, Inc. of 8106 E. Admiral Rd., Tulsa, Okla. Cost of the animated units ranges from about $1100 for the less complex system panels to over $3000 for the propeller control circuit panel. The three-dimensional mock-ups cost AA under $600 each.



Growing use of portable X-ray equipment for inspection of hidden aircraft structures without the need for time-consuming disassembly is demonstrated above in the use of Andrex equipment by Lockheed. Andrex X-ray weighs about 300 pounds, operates from 110-, 220- or 440-volt supply, and consists of a control panel, power cable, and X-ray tube head. It is produced by Holger Andreason, Inc., 703 Market St., San Francisco.

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the U.S. Navy's

Douglas F4D Skyray

Streaking each mile in *less* than 5 seconds, during four passes at a 3-kilometer course, a Douglas F4D Skyray returned the official world speed record to the United States.

Two weeks later, Skyray blazed into a 100-kilometer course, cracked all records by an even wider margin. Now in production for the Navy, this delta wing jet interceptor adds terrific climb and firepower to its speed—plus the ease of handling needed in carrier landings. The Douglas F4D Skyray has now passed its initial carrier tests, in service will guard our fleets against the fastest of modern jet bombers.

Performance of the Navy's F4D Skyray is another example of Douglas leadership in aviation. Faster and farther with a bigger payload is always the basic rule of Douglas design.

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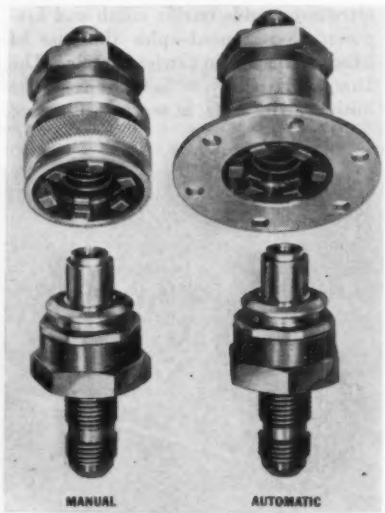
New Products

Cleaner. New aircraft cleaning materials, a fabric cleaner, and a polish for painted, lacquered, or doped fabric surfaces have been placed on the market by The Permatex Co.

The fabric cleaner is non-explosive and is intended for removal of ink and food stains, chewing gum, grease, and oil from aircraft interior upholstery.

The new polish is a "one-operation" compound containing four per cent silicone which removes grime and oxidized paint as it is applied and leaves a hard lustrous protective finish when wiped off. Both are packaged in one-pint and one-gallon containers.

Address: **The Permatex Co., Inc.**, Dept. AAP, Brooklyn 35, N. Y.



Coupling. The Inst-O-Matic, a new hydraulic coupling which can be disconnected under full pressure either manually or automatically, has been developed by the E. B. Wiggins Oil Tool Co.

The manually operated unit can be disconnected instantly with a "pull" or installed with a "push-pull" action. The automatic model can be set to disconnect at a desired load weight or a predetermined system pressure.

The new Wiggins couplings can be adapted in favor of either weight or flow. Where pressure drop is a consideration, larger couplings can be used on smaller diameter tubing; if weight is a problem, smaller couplings can be used.

All couplings are designed for potential aircraft applications with the new ¾" size said to be lighter than other available couplings. Substitution for AN 6241 and AN 6242 units can be made without altering the mounting method.

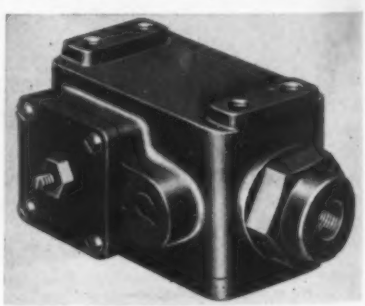
Address: **E. B. Wiggins Oil Tool Co.**, Dept. AAP, 3424 East Olympic Blvd., Los Angeles 23, Calif.

Workstand. The Weber Aircraft Corp. of Burbank, Calif., has announced the development of a Model 30 Aerostand to meet the demand of the commercial airlines and military services for a workstand which permits ready servicing of vertical tail areas on large transports.

The new Aerostand has a minimum height of 23 feet with a pantograph hydraulic adjustment up to 30 feet. This maximum height can be further extended to 34 feet by using the Model 4 Aerostand on the upper platform.

For ease of operation, the actuating hand pump on the Model 30 is located at the 20-foot level, and a hydraulic ram safety lock is readily available to the operator. The base frame mounts four heavy-duty, screw-type ground locks, which immobilize the stand and act as a leveling device when working on irregular surfaces.

Address: **Weber Aircraft Corp.**, Dept. AAP, 2820 Ontario St., Burbank, Calif.



Regulator. The Aro Equipment Corp. of Bryan, O., has announced a new model 10700 air or oxygen pressure reducing regulator which is said to weigh about one half as much as comparable regulators and is only one fourth their size. The new Aro product weighs eight

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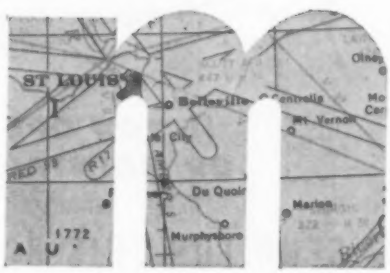
To implement this final link in CAA's common system of VHF navigation, Narco introduces its Model UDI-1 Distance Measuring Equipment for commercial and corporate aircraft use.

Perfected after years of exhaustive development under CAA/ANDB sponsorship, this new Narco DME is built to full air transport standards and has many exclusive features such as crystal-tuning.

This fine, new airline-tested DME, introduces Narco's new Sapphire line of navigation and communications equipment designed to the highest possible electronic standards unsurpassed for reliability and performance.



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- **Exclusive crystal tuning**
- **Unitized construction for efficient servicing**
- **Backed by a nationwide network of especially-equipped DME service centers**

Weighing less than 33 pounds, Narco DME equipment consists of a remote unit mountable on a standard ½ ATR rack, a channel selector, and panel-mounted instrument which indicates distances in two ranges 0-200 miles and 0-20 miles.

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It *does* analyze vibration as well as ignition.

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ounces and measures 1⅝" x 1 15/16" x 2 21/32".

Capacity of the regulator in terms of inlet pressure is 2000 psi, with adjustable output pressure from 50 to 300 psi and flows up to 300 liters per minute. The output pressure variation from zero to full flow is about 15%, and the unit will handle flows larger than 300 liters if the pressure drop from zero to full flow is allowed to go beyond 15%.

Address: **The Aro Equipment Corp.**, Bryan, O.

Technical Literature

SHUT-OFF VALVES: Sprague Engineering & Sales Corp., 1144 W. 135th St., Gardena, Calif., has issued a new bulletin on its S-214 series of automatic shut-off valves for protection of gages and instruments in hydraulic or pneumatic systems against overloads.

CONTROL SYSTEMS: Education Bulletin F 6149 on "Temperature Control Systems" is available from the Wheelco Instruments Div. of the Barber-Colman Co., Rockford, Ill.

TRAMRAIL EQUIPMENT: Eight-page folder describes complete line of Tramrail Systems, conceived by The Forker Corp., 2044 Random Rd., Cleveland 6, Ohio.

OPTIMAL CLIMBING: Garbell Aeronautical Series Study No. 8 titled "Optimal Climbing Techniques for High-Performance Aircraft" describes techniques used in minimizing altitude climb time, distance, and fuel consumption during climb.

AIRLINE SANITATION: The Handbook on Sanitation of Airlines has been published by the Public Health Service, U. S. Dept. of Health, Education and Welfare, superseding, as far as airline sanitation is concerned, the Sanitation Manual for Land and Air Conveyances Operating in Interstate Traffic. For sale through the U. S. Govt. Printing Office, Washington 25, D. C.

AIRCRAFT PULLEYS: A new eight-page bulletin on Insurok laminated and macerated plastic aircraft pulleys to meet government specifications has been published by The Richardson Co., 2600 Lake St., Melrose Park, Ill.

POWER TUBES: Amperex Electronic Corp., Hicksville, N. Y., has prepared a three-color chart showing the rating in power output versus frequency for Amperex power tubes in typical operation.

EXPANSION BELLOWS: Metal expansion bellows for conveying gas and liquids are detailed in six-page Bulletin No. 330 issued by Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N. J.

PHOTO CREDITS

Cover—Marquardt; 15—McDonnell; 16—Lockheed; 17—Sikorsky; 21—AA; 30—Convair; 32—Transit Vans; 34—USN; 50—Humbolt County; 67—de Havilland; 68—Bristol.

Domestic Airline Traffic for October, 1953

AIRLINES	REVENUE PASSENGERS	REVENUE PASSENGER MILES	AVAILABLE SEAT MILES	PASSENGER LOAD FACTOR	MAIL TON MILES **	EXPRESS TON MILES	FREIGHT TON MILES	TOTAL TON MILES REV. TRAFFIC	AVAILABLE TON MILES FLOWN	% AVAILABLE TON MILES USED	REVENUE PLANE MILES	SCHEDULED MILES	% SCHEDULED MILES COMPLETED
				%									
American #	537,373	291,839,000	455,166,000	64.12	1,578,070	924,198	5,306,614	35,689,792	60,547,600	58.95	9,400,721	9,397,625	99.31
Braniff *	118,326	45,371,000	77,089,000	58.86	146,504	105,691	222,991	4,816,707	8,248,314	58.40	2,006,207	1,956,519	99.65
Capital #	203,273	64,004,000	111,621,000	57.34	290,210	228,287	414,085	7,049,689	15,187,774	46.42	2,638,043	2,543,282	99.00
Caribair	8,325	694,000	1,335,000	51.99	798	. . . .	1,472	65,290	139,650	46.75	54,107	52,066	98.67
Colonial	34,208	8,587,000	14,984,000	57.31	13,302	7,885	26,843	845,424	1,642,664	51.47	418,999	388,205	98.54
Continental	32,689	13,423,000	26,673,000	50.32	48,221	16,523	74,640	1,425,858	3,389,942	42.06	691,762	675,248	99.72
Delta-C&S	142,978	53,362,000	101,640,000	57.42	261,221	211,045	546,849	6,615,669	12,058,630	54.86	2,485,395	2,482,869	99.10
Eastern	386,651	172,633,000	309,512,000	55.78	507,113	373,004	754,446	19,535,167	40,530,589	48.20	5,698,248	5,665,166	99.57
Hawaiian	29,906	3,865,000	7,418,000	52.10	3,331	. . . .	116,498	446,676	1,019,277	43.82	245,303	234,298	99.46
National	57,861	37,842,000	65,583,000	57.70	143,746	59,712	524,086	4,567,008	7,605,833	60.05	1,333,924	1,345,525	96.94
Northeast	35,925	7,155,000	13,914,000	52.95	12,003	15,038	21,102	694,391	1,325,896	52.37	489,446	471,062	94.39
Northwest	92,093	63,969,000	108,345,000	59.04	269,493	162,040	396,698	7,131,387	12,360,673	57.69	1,859,269	1,888,409	97.63
Trans Pac.	12,856	1,561,000	3,587,000	43.52	866	124	7,390	130,904	297,890	43.94	128,094	111,224	98.84
TWA #	270,484	208,650,000	344,030,000	66.44	1,174,664	606,139	1,680,899	23,424,322	38,425,442	60.96	5,917,605	6,089,161	96.44
United #	350,412	232,047,000	340,405,000	68.17	1,743,408	903,720	2,619,561	27,498,809	49,249,114	55.84	7,068,161	7,110,806	99.48
Western	71,577	30,837,000	53,238,000	57.92	125,119	67,012	115,399	3,252,269	5,929,455	54.85	1,225,663	1,222,473	99.06
TOTALS	2,384,937	1,240,839,000	2,004,538,000	61.90	6,318,369	3,680,418	12,829,573	143,189,362	257,955,746	55.51	41,630,949	41,603,932	98.72

* Braniff's figures do not include operations of local service route 106 operated by Braniff as a result of Braniff-NCA merger.
** Mail ton-mile figures include air parcel post.
# Mail ton-mile figure includes first class mail carried by air as follows: 161,240 for American; 84,987 for Capital; 117,816 for TWA. United did not report breakdown on CAB report.

NOTE: Above figures include both scheduled and non-scheduled operations.

Domestic Airline Traffic for November, 1953

AIRLINES	REVENUE PASSENGERS	REVENUE PASSENGER MILES	AVAILABLE SEAT MILES	PASSENGER LOAD FACTOR	MAIL TON MILES ***	EXPRESS TON MILES	FREIGHT TON MILES	TOTAL TON MILES REV. TRAFFIC	AVAILABLE TON MILES FLOWN	% AVAILABLE TON MILES USED	REVENUE PLANE MILES	SCHEDULED MILES	% SCHEDULED MILES COMPLETED
				%									
American	448,210	242,557,000	404,179,000	60.01	1,532,002*	687,997	4,876,214	30,940,151	54,111,899	57.18	8,440,469	8,633,508	97.01
Braniff **	101,774	39,833,000	72,004,000	55.33	139,128	83,443	202,256	4,234,903	7,694,850	55.04	1,879,999	1,866,563	98.71
Capital	174,312	53,735,000	95,668,000	56.17	265,787*	154,644	430,266	5,988,566	13,229,588	45.27	2,262,966	2,296,000	95.00
Caribair	8,245	681,000	1,298,000	52.37	783	. . . .	1,688	64,437	131,060	49.17	50,779	50,010	99.44
Colonial	25,239	6,357,000	12,296,000	51.70	12,299	5,864	21,326	646,105	1,356,730	47.62	324,207	313,966	94.96
Continental	27,357	11,304,000	24,597,000	45.96	46,124	14,373	68,166	1,211,513	3,171,029	38.21	639,360	636,916	98.38
Delta-C&S	133,320	55,508,000	97,228,000	57.09	247,106	169,383	494,085	6,234,448	11,517,430	54.13	2,335,016	2,340,227	98.98
Eastern	357,277	167,162,000	296,738,000	56.33	463,697	305,851	754,981	18,361,744	38,838,814	48.57	5,436,811	5,437,009	97.95
Hawaiian	27,555	3,620,000	6,359,000	52.78	3,760	. . . .	103,270	415,556	933,444	44.52	232,179	195,426	98.92
National	59,780	42,529,000	68,326,000	62.24	134,252	43,377	446,222	4,949,840	8,161,551	60.65	1,333,790	1,297,103	97.92
Northeast	28,544	5,625,000	11,669,000	48.20	11,395	11,216	17,118	561,567	1,144,142	49.08	419,515	451,370	88.45
Northwest	74,421	51,194,000	100,389,000	51.00	250,337	109,081	299,250	5,697,302	11,328,250	50.29	1,683,729	1,710,233	97.61
Trans Pac.	11,177	1,326,000	3,302,000	40.16	388	115	7,600	112,123	271,891	41.24	117,908	107,554	97.54
TWA	228,956	173,154,000	293,727,000	58.95	1,167,072*	527,272	1,621,981	19,885,925	36,125,283	55.05	5,536,882	5,753,979	95.57
United	300,324	195,635,000	312,609,000	62.58	1,740,562*	709,415	2,247,165	23,467,207	45,118,716	52.01	6,486,353	6,608,594	97.11
Western	63,477	26,483,000	50,611,000	52.32	124,163	59,337	127,129	2,339,397	5,582,837	50.36	1,178,802	1,191,682	98.35
TOTALS	2,071,498	1,078,704,000	1,851,490,000	58.15	6,138,855	2,881,368	11,718,747	126,110,784	238,717,514	52.83	38,358,764	38,890,140	97.05

* Mail ton-mile figure includes first class mail carried by air as follows: American, 194,270; Capital, 90,386; TWA, 134,431; United, 155,847.
** Braniff's figures do not include operations of local service route 106 operated by Braniff as result of Braniff-NCA merger.
*** Mail ton-mile figures include air parcel post.

NOTE: Above figures include both scheduled and non-scheduled operations.

Alaskan Revenues & Expenses, Six Months Ended June 30, 1953

AIRLINES	TOTAL OPERATING REVENUES	PASSENGER REVENUES	MAIL REVENUES	EXPRESS REVENUES	FREIGHT REVENUES	EXCESS BAGGAGE REVENUES	NON-SCHEDULED TRANSPORT REV.	TOTAL OPERATING EXPENSES	AIRCRAFT OPERATING EXPENSES	GROUND & INDIRECT EXPENSES	NET OPERATING INCOME BEFORE INCOME TAXES
Alaska*	$ 2,356,769	$ 519,010	$ 1,504,840	$ 9,521	$ 223,110	$ 6,242	$ 131,088	$ 2,106,798	$ 1,013,185	$ 1,093,613	$ 249,971
Alaska Coastal	507,771	209,132	235,977	15,072	9,749	4,740	30,663	495,268	220,735	274,533	12,503
Byers	49,235	8,231	33,681	. . . .	4,761	348	2,125	34,351	16,396	17,955	14,884
Cordova	274,792	47,014	201,561	. . . .	9,763	1,142	13,544	302,151	141,302	160,849	-27,360
Ellis	346,012	153,208	152,734	22,173	. . . .	2,890	14,774	343,722	145,717	198,004	2,290
North. Consol.	1,354,635	217,569	942,589	2,250	71,933	6,988	78,892	1,095,734	524,666	571,069	258,901
Pac. Northern**	2,638,930	1,452,311	870,950	. . . .	291,477	19,013	768	2,519,542	1,138,270	1,381,272	119,388
Reeve	384,813	113,636	155,573	. . . .	12,032	2,749	75,040	313,145	164,304	148,841	71,668
Wien Alaska	1,026,644	127,354	687,242	2,667	51,014	3,286	132,557	1,088,090	552,612	535,479	-61,447
TOTALS	8,939,601	2,847,465	4,795,147	51,683	673,859	46,698	479,451	8,298,801	3,917,187	4,381,615	640,798

* Figures include U.S.-Alaska and intra-Alaska operations.
** Figures include both Alaskan and overseas operations.

International Airline Traffic for October, 1953

Airlines	Revenue Passengers	Revenue Passenger Miles	Available Seat Miles	Passenger Load Factor %	U. S. Mail Ton-Miles *	Foreign Mail Ton-Miles	Express Ton-Miles	Freight Ton-Miles	Total Ton-Miles Rev. Traffic	Available Ton-Miles Flown	% Available Ton-Miles Used	Revenue Plane-Miles	Scheduled Miles	% Scheduled Miles Completed
American	9,052	6,488,000	9,965,000	65.11	16,854	5,499	556	219,824	932,429	1,451,608	64.23	190,065	191,730	99.13
Braniff	2,217	5,235,000	12,974,000	40.35	70,813	6,839	....	83,663	759,030	1,790,299	42.40	293,547	299,143	98.13
Colonial	3,558	2,751,000	3,765,000	73.07	1,452	458	....	6,666	299,541	599,666	49.95	65,138	50,076	96.14
Delta-C&S	2,691	3,104,000	7,500,000	41.39	12,853	1,202	....	121,770	459,244	1,029,391	44.61	159,401	160,228	99.48
Eastern	11,451	16,198,000	28,623,000	56.59	56,387	....	....	65,118	1,877,239	3,635,169	51.64	449,310	430,211	98.77
National	8,193	3,530,000	8,369,000	42.18	4,990	....	1,441	45,185	417,893	1,142,116	36.59	142,406	142,476	97.97
Northwest	6,013	9,605,000	19,034,000	50.46	105,174	21,677	13,320	697,584	1,873,071	3,023,825	61.94	492,497	502,919	97.08
Panagra	10,696	11,199,000	20,927,000	53.51	37,750	30,070	....	251,529	1,571,690	2,817,828	55.78	493,494	494,264	99.62
Pan American														
Latin Amer	59,855	63,877,000	104,416,000	61.18	274,995	67,451	....	2,498,503	9,155,296	14,241,693	64.29	2,241,448	2,105,374	95.09
Atlantic	50,839	59,829,000	99,178,000	60.32	664,958	157,353	....	1,311,695	8,464,346	13,168,604	64.28	1,690,100	1,689,400	95.02
Pacific	10,777	39,283,000	56,958,000	68.97	367,366	111,506	....	720,887	5,485,549	9,550,096	57.44	1,056,607	999,419	100.00
Alaska	4,876	4,832,000	9,855,000	49.03	31,915	....	....	411,920	965,341	1,655,290	58.32	257,638	259,525	98.25
TWA	18,729	47,572,000	76,386,000	62.28	386,853	150,834	....	883,660	6,426,571	9,257,946	69.42	1,612,118	1,600,528	98.55
United	5,043	12,507,000	17,735,000	70.52	76,097	....	....	46,140	1,392,605	1,884,867	73.88	310,139	310,157	98.45
TOTALS	203,990	286,010,000	475,685,000	60.12	2,108,457	552,889	15,317	7,364,144	40,079,845	65,248,398	61.43	9,453,908	9,235,450	97.24

* U.S. mail ton-mile figures include air parcel post.

NOTE: 1. Above figures include both scheduled and non-scheduled operations.
2. Data in above tabulations were compiled by American Aviation Publications from reports filed by the airlines with the Civil Aeronautics Board. Figures for American Airlines include that carrier's service to Mexico but not to Canada; for Braniff to South America; Delta-C&S to South America; Colonial to Bermuda; Eastern to Puerto Rico; National to Havana; Northwest to Orient and Honolulu, and United to Honolulu. Operations of U.S. carriers into Canada are included in domestic reports to CAB, in accordance with CAB filing procedures.

International Airline Revenues & Expenses, Quarter Ended Sept. 30, 1953

Airlines	Total Operating Revenues	Passenger Revenues	U. S. Mail Revenues	Foreign Mail Revenues	Express Revenues	Freight Revenues	Excess Baggage Revenues	Non-Scheduled Transport Rev.	Total Operating Expenses	Aircraft Operating Expenses	Ground & Indirect Expenses	Net Operating Income
American	$ 1,229,266	$ 1,023,762	$ 20,798	$ 17,333	$ 570	$ 116,426	$ 15,293	$	$ 1,156,162	$ 555,353	$ 600,809	$ 73,104
Braniff	2,174,520	1,460,212	513,111	37,501	....	109,916	48,529	....	2,211,543	1,061,203	1,150,340	-37,023
Colonial	736,800	696,902	14,994	3,100	....	4,173	2,847	5,607	678,082	332,192	345,890	58,718
Delta-C&S	915,251	784,245	25,148	4,006	....	75,310	23,195	....	1,006,150	503,126	503,024	-90,899
Eastern	2,994,777	2,359,957	63,180	....	....	31,341	31,895	508,536	1,689,896	1,059,937	629,959	1,304,881
National	868,082	816,025	7,563	....	2,747	20,076	15,804	5,867	995,453	465,780	529,673	-127,371
Northwest	5,096,904	2,915,853	1,272,193	100,212	13,763	671,713	35,125	....	4,709,648	2,197,943	2,511,705	387,256
Panagra	4,322,370	2,985,538	625,430	106,189	....	365,272	115,660	42,330	4,106,653	1,737,922	2,368,731	215,717
Pan American												
Latin Amer.	22,407,288	13,296,860	6,266,125	280,504	....	1,798,890	284,842	88,756	15,894,325	6,255,826	9,638,499	6,512,963
Atlantic	23,563,087	17,863,469	3,066,600	611,260	....	1,311,101	354,154	259,593	19,131,153	9,685,592	9,445,561	4,431,934
Pacific	13,027,729	8,638,055	2,903,754	326,884	....	821,465	129,819	75,212	10,229,622	5,548,322	4,681,300	2,798,107
Alaska	2,199,000	1,298,549	395,600	....	....	317,499	10,964	166,306	1,844,683	898,592	946,091	354,317
TWA *	15,165,190	12,507,051	816,810	531,040	....	812,611	276,734	47,158	13,513,093	6,431,672	7,081,421	1,652,097
United	2,388,476	2,250,769	62,915	....	....	32,023	16,553	....	2,488,719	1,540,606	948,113	-100,243
TOTALS	97,088,740	68,897,247	16,054,221	2,018,029	17,080	6,487,816	1,361,414	1,199,415	79,655,182	38,274,066	41,381,116	17,433,558

* Compensation for carriage of U.S. mail has been paid on the basis of temporary rates.

NOTE: Data in above tabulations were compiled by American Aviation Publications from reports filed by the airlines with the Civil Aeronautics Board. Figures for American Airlines include that carrier's service to Mexico but not to Canada; for Braniff to South America; Delta-C&S to South America; Colonial to Bermuda; Eastern to Puerto Rico; National to Havana; Northwest to Orient and Honolulu, and United to Honolulu. Operations of U.S. carriers into Canada are included in domestic reports to CAB, in accordance with CAB filing procedures.

Local Service Airline Traffic, October, 1953

Airlines	Revenue Passengers	Revenue Passenger Miles	Available Seat Miles	Passenger Load Factor %	Mail Ton Miles	Express Ton Miles	Freight Ton Miles	Total Ton Miles Rev. Traffic	Available Ton Miles Flown	% Available Ton Miles Used	Revenue Plane Miles	Scheduled Miles	% Scheduled Miles Completed
Allegheny	20,752	3,182,000	7,622,000	41.74	6,205	13,567	. . .	323,036	762,257	42.38	317,607	315,741	98.76
Bonanza	5,316	1,202,000	3,500,000	34.34	1,741	1,508	3,422	121,726	345,753	35.21	145,826	146,351	99.31
Braniff *	5,346	1,041,000	2,028,000	51.33	2,237	2,482	2,743	106,667	202,790	52.60	84,496	84,611	99.86
Central	3,018	486,000	2,996,000	16.21	3,318	1,140	2,133	50,286	273,563	18.38	158,408	160,209	98.88
Frontier	10,900	2,695,000	7,597,000	35.47	7,739	5,582	33,357	304,484	723,564	42.08	362,077	361,354	99.56
Lake Central	6,182	956,000	3,724,000	25.67	2,182	9,150	. . .	97,623	401,076	24.34	167,729	169,446	97.42
Mohawk	16,559	2,912,000	5,576,000	52.22	2,666	6,323	9,669	278,212	699,203	39.79	265,496	256,352	98.31
N. Central	22,305	3,852,000	8,476,000	45.45	10,401	15,337	. . .	390,432	963,722	40.51	403,633	398,694	99.14
Ozark	13,516	2,239,000	7,182,000	31.17	3,649	5,296	. . .	218,255	708,188	30.82	287,297	284,050	98.28
Piedmont	25,128	5,144,000	11,086,000	46.40	8,294	9,798	16,958	527,382	1,266,962	41.63	527,901	521,489	99.94
Pioneer	11,898	3,118,000	6,857,000	45.47	9,043	3,322	11,790	321,854	750,010	42.91	287,453	289,168	98.26
Southern	10,368	1,813,000	5,666,000	32.00	6,499	8,423	. . .	188,256	613,909	30.67	272,559	268,577	98.72
Southwest	17,145	3,438,000	6,110,000	56.27	6,202	4,094	7,276	345,495	672,645	51.36	260,716	210,045	99.38
Trans-Texas	10,242	2,200,000	7,880,000	27.93	8,630	4,390	10,775	233,344	900,619	25.91	375,258	375,782	99.44
West Coast	13,535	2,452,000	6,768,000	36.23	4,398	2,089	3,603	231,396	550,214	42.06	294,692	298,124	98.01
TOTALS	192,210	36,730,000	93,068,000	39.46	83,204	92,501	101,726	3,738,448	9,834,475	38.01	4,191,148	4,140,293	98.95
						Helicopter Services							
HAS	. . .	. . . .	. . . .	. . .	2,459	. . .	. . .	2,459	5,796	42.43	29,108	29,413	99.00
Los Angeles	. . .	. . . .	. . . .	. . .	5,041	. . .	. . .	5,041	13,618	37.02	29,928	31,721	92.81
N.Y.Airways	414	7,000	41,000	17.07	3,611	. . .	222	4,514	14,170	31.85	36,022	42,724	81.78

* Figures cover operations of local service route 106 operated by Braniff Airways as result of Braniff-MCA merger.

NOTE: Above figures include both scheduled and non-scheduled operations.

Airline Commentary

By Eric Bramley

WE HEAR increasing talk among airlines that the private auto is the big source that must now be tapped for air travel, and that there must be even more emphasis on airline rent-a-car promotion and advertising. We were, therefore, interested to hear the remarks of **Joe Stedem,** vice president of Hertz, at Northwest Airlines' recent sales conference.

Joe, a veteran in the business, pointed out that 1952's inter-city auto passenger-miles totaled 450 billion, and that if only five per cent of this traffic were lured off the highways, airlines would have to double their fleets to carry it. He suggested that airline agents ask *all* passengers if they need cars at destination. This would benefit Hertz, of course, but might also result in a passenger using air instead of auto on a future trip, once he tried rent-a-car, he said. He added that 40% of Hertz' out-of-town business now arrives by air, against 20% rail.

Another good point was made by **Vin Conroy,** vice president of Avis, who noted that 75% of his company's business is commercial, against only 25% pleasure, leaving plenty of room for development of vacation travel. It all adds up to interesting business possibilities for airline rent-a-car.

•

Western Air Lines boasts the only airline salesman in the world who owns a Rolls-Royce. He's Al Freeman. Al drives to work in his Buick, but he actually plunked out something like $12,000 cash for a new Rolls not long ago, one of the few such luxury cars in Los Angeles. He gets kidded plenty, but his comeback is that the initial investment may be high but look what you save on maintenance—you don't have to take it to a gas station for a grease job every 1000 miles or so; just press a button and the car lubricates itself. Al comes from a wealthy family but works hard at his job for WAL. He was with TWA before joining WAL three years ago and thinks the airline business is good.

•

Among the pilots: Best Stratocruiser landings we've ever experienced were made by **Capt. Harold Kittleson,** Northwest Airlines . . . **Capt. Bart Hewitt,** TWA, is strictly out of uniform while at the controls. He wears a railroad engineer's cap. "My grandpappy left it to me," he tells us. "He was an engineer on the Santa Fe. I'm trying to wear it out." Hewitt, incidentally, is a whiz on the public address system . . . Congratulations to TWA **Capt. Floyd Hall** for excellent PA announcement on difference in engine noise when switching from climb to cruise. This worries many passengers . . . Delta-C&S **Capt. Jack Adams** had aboard a mother and seriously ill three-year-old daughter (airline employe's family riding passes) Memphis-Little Rock, where they were to connect for Kansas City. Connection was missed; overnight layover would be necessary. Without even asking the names of mother and child, Capt. Adams gave the Little Rock agent his personal check for transportation on Braniff to Kansas City via Tulsa, meals and long distance calls. This isn't the first time Jack Adams has dipped into his own pocket to help passengers.

•

ODDS AND ENDS: Airlines have agreed on speeds of the DC-7 to be used in Douglas and airline ads: 410 mph top speed, 365 mph cruise . . . Douglas will spend over $1 million in 1954 promoting its transports, with emphasis on DC-7 . . . American Automobile Association is distributing 145,000 pamphlets, "It's Easier to Fly," to its auto clubs urging their travel agents to promote air travel on scheduled airlines . . . Piedmont Airlines is starting an expanded advertising program with appointment of Liller, Neal and Battle, of Atlanta and New York, as its advertising agency . . . General Mills has started its program (revealed here several weeks ago) of distributing airline stickers in 6,000,000 Wheaties packages. Fourteen lines are in the promotion, which is costing General Mills $145,000 for TV, radio, and other ads.

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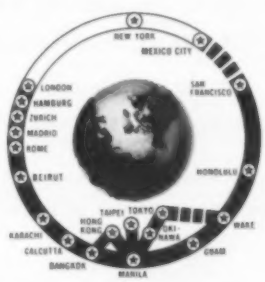

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People

MANUFACTURING

Gardiner G. Greene has become principal stockholder and president of Browning Laboratories, Inc., Winchester, Mass. **Dr. Browning**, founder and former president of the firm, is now chairman of the board, and will continue in an advisory capacity.

Louis Wozar has been appointed president and general manager of the Dayton Pump and Manufacturing Company.

William C. Winterhalter has been named executive vice president and general manager of H. I. Thompson Fiber Glass Co. Winterhalter joins Thompson from Owens-Corning Fiberglas Corp., where he served as vice president and Pacific Division sales manager.

Winterhalter

Johnson

W. E. P. Johnson has been named to head Solar Aircraft Company's newly created European Division. To accept the Solar post, Johnson resigned as managing director of Power Jets (Research and Development) Ltd.

W. G. Bain has been elected a vice president of Republic Aviation Corporation.

Leslie E. Lynde is now executive vice president-defense products for the Westinghouse Electric Corp., succeeding **Latham E. Osborne**, who has moved up to executive vice president of the corporation.

John R. Alison, onetime Assistant Secretary of Commerce for Aeronautics, has been elected administrative vice president of Northrop Aircraft, Inc.

C. W. Reynolds has been elected vice president of public and industrial relations of the Garrett Corporation, and **G. S. Williamson** has been elected vice president of manufacturing for the AiResearch Manufacturing Divisions of Garrett.

W. C. O'Connell has been appointed general manager of the General Electric Company's Aircraft Accessory Turbine Department, replacing **J. S. Parker**, who will continue his duties as general manager of the Small Aircraft Engine Department.

Nils H. Lou has been named chief manufacturing engineer for Republic Aviation Corp. Prior to joining Republic, Lou was vice president of manufacturing for Harry Ferguson, Inc., of Detroit.

Luther S. Smith, Brig. Gen USAF (Ret.), has joined TEMCO Aircraft Corp. as special assistant to the president.

William C. Gage has been named

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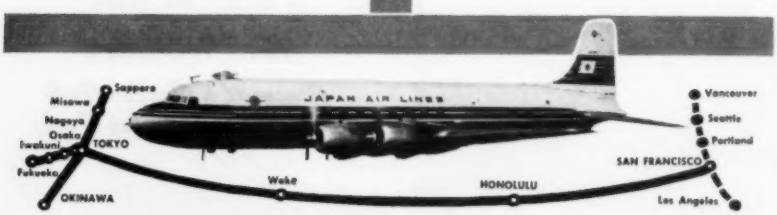

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JAPAN AIR LINES

WINGS OF THE NEW JAPAN

sales manager of Flexonics Corporation's aircraft division, succeeding **Thomas K. Wells,** who was recently promoted to general sales manager.

AIRLINES

Ford Studebaker, vice president of operations and development of Hawaiian Airlines, has been elected to the company's board of directors and made assistant manager of the airline. Studebaker replaces **Robert Williams** on HAL's board. Williams resigned recently to become chairman of the Territorial Public Utilities Commission.

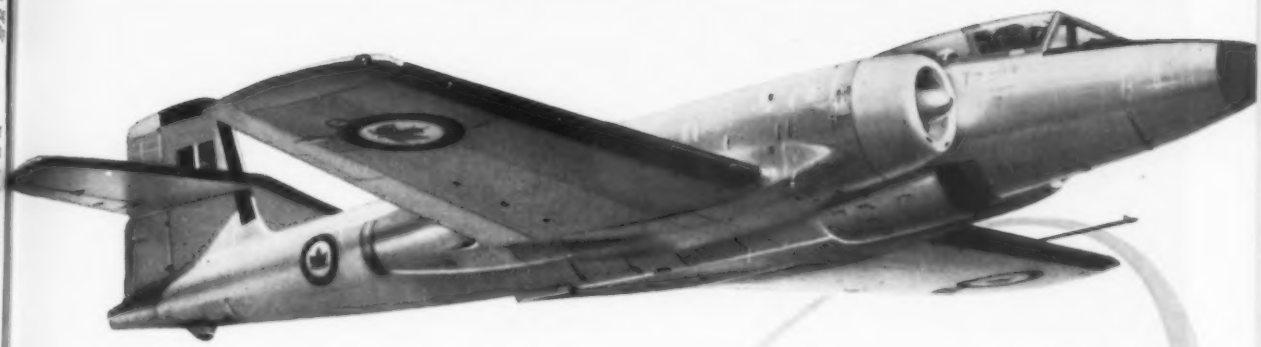
Ray T. Elsmore has resigned as senior vice president and a member of the board of directors of Transocean Air Lines to devote full time to his duties as president and director of Western Sky Industries.

S. F. McCullough has been appointed general sales manager for Ozark Air Lines. Prior to joining Ozark, McCullough was supervising agent for the Civil Aeronautics Administration Safety District Office in St. Louis.

James F. Montgomery of Pan American World Airways' Atlantic Division has moved from district traffic and sales manager in the United Kingdom to passenger sales manager in PAA's U. S. sales organization in New York. **James O. Leet,** formerly stations operations manager in London has moved up to the traffic and sales manager's post.

The following employes recently completed 20 years or more of service in the aviation industry:

- **Joseph Hickey,** Boeing Airplane Co. Factory service attendant, Seattle. 20 years.
- **Wilbur Boley,** Boeing Airplane Co. Process coordinator, Seattle. 20 years.
- **John Kristerson,** Boeing Airplane Co. Process coordinator, Seattle. 20 years.
- **Garner Green,** chief structures engineer, Convair San Diego, 25 years.
- **O. A. Smith,** American Airlines. Foreman, Tulsa. 20 years.
- **E. O. Crews,** American Airlines. Operations and sales manager, Joplin. 20 years.
- **W. E. Stendel,** American Airlines. Lead mechanic, Tulsa. 20 years.
- **D. T. Rice,** American Airlines. Stewardess service superintendent, New York. 20 years.
- **F. J. Robinson,** American Airlines. Agency sales district manager, New York. 20 years.
- **Haakon G. Gulbransen,** Pan American World Airways. Captain, New York. 20 years.
- **John W. Stone,** Trans World Airlines. Manager, communications operations, Kansas City. 20 years.



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CF100 FLIES 2100 MILES NON-STOP AT 550 M.P.H.

North of the American border, R.C.A.F. squadrons equipped with the jet powered AVRO Canada CF100 roam the perimeter of the Arctic on flights that exceed the range of any other interceptor in the world.

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Board Proposes Temporary Service Rates

Objections by the Post Office Department to a CAB rate order for four domestic trunk lines led the Board last week to propose temporary service rates for the carriers and pave the way for a full-scale proceeding on final rates.

The four carriers—Braniff, Capital, Western, and Delta—have been ordered to show cause why their service mail rate from January 1, 1954, should not be split to provide (a) 45¢ on segments competitive with existing 45¢ carriers; and (b) 53¢ on other segments. These would be temporary, subject to retroactive adjustment after formal proceedings.

The new order differs from a Christmas Eve proposal of the Board's which contemplated final rates for the four lines of 45¢ on competitive segments and rates sufficiently high on non-competitive routes to produce a total overall average of 53¢ per ton-mile. The PO objected to this proposal.

CAB said the second and newest show-cause order is designed to prevent the four trunks from losing mail volume which the PO otherwise might give to other lines with lower rates.

Other developments in the complicated mail rate field included:

• **Establishment of final rates** for National's entire system and Northwest's domestic system of 45¢ per ton-mile; a reduction from 53¢.

• **Petition of Pan American-Grace Airways** to increase its service rate from the present 88¢ to the maximum Universal Postal Union level of approximately $1.92 for letter mail. Panagra conditioned its petition on a similar increase for all other U.S. international airlines.

• **Post Office Department** supported local service airlines' request to transport surface mail at a special 30¢ per ton-mile rate for the remainder of 1954.

Antitrust Suit Draws Fire from Carriers

The Justice Department's anti-trust suit against Pan American World Airways, W. R. Grace & Co., and jointly owned Panagra, produced these comments from the three companies involved:

• **GRACE:** "The public interest has always been the only standard of W. R. Grace & Co., in connection with Panagra. Grace has demonstrated in administrative proceedings and in the courts that its ownership of half the stock of Panagra is in the public interest. In all respects, in every instance, the activities of Grace have received the approbation of those tribunals."

• **PAA:** "There is not the slightest basis for this action of the Justice Department. We are confident that the courts will uphold the propriety of Panagra's continuing as a part of the Pan American World Airways system as it has been for a quarter of a century."

• **PANAGRA:** "As one of the first U. S. flag international airline operators, we have always maintained, as we do today, a recognized position as one of the outstanding U. S. flag carriers in the international field. Our two stockholders (PAA and Grace) are in agreement that Panagra's airplanes should come through to New York. CAB has held that this is in the public interest. Its examiner, after lengthy hearings, has recommended to the Board that Panagra's planes should come through to New York. The matter is under consideration by the Board. With this in the immediate offing, it is far-fetched to talk of restraints of trade."

PAA and Grace each own 50% of Panagra's stock and each possesses four seats on Panagra's eight-man board. The Justice suit, filed in New York Federal Court for the southern district, seeks to divest PAA and Grace of their stock ownership in Panagra. Case covers an eight-year period dating back to 1945 when CAB first requested intervention by the Justice Department.

CAB MISCELLANY

Southwest Airways applied for "at least a 15-year" renewal of its local certificate, which is slated to expire September 30, 1954. Carrier also asked non-renewal at six points and continuation of United's suspension at four common points.

Braniff Airways wants immediate suspension authority for two Minnesota towns — Austin and Owatonna — at which, BNF says, expenses far exceed revenues.

Ozark Airlines applied for exemption to serve Columbia, Mo., between St. Louis and Springfield, Mo., and to operate a segment between Jefferson City, Columbia, and Kansas City.

CAB News

AS OF NOW . . .

The question of whether the five-year experiment with specialized all-freight airlines has been a success has been wrapped up in a new proceeding getting under way February 9—**The Domestic All-Cargo Certificate Renewal Case.** Primarily, it involves Slick, Flying Tigers, and U. S. Airlines, whose temporary certificates expire this fall. Seven other applicants are involved, however. Also, the important issue of cargo lines carrying U. S. mail. Case will run at least through this year.

Another significant new case started recently is a major international route proceeding—**U. S.-South American Service Case.** It is directed mainly at service to Rio de Janeiro and Buenos Aires via Manaos. Braniff, Pan American, Delta-C&S, Riddle, and Trans-Caribbean Airlines are applicants.

The CAB's opinion-writing division is working on a new Board opinion in the **Colonial-Eastern Merger Case,** following return of an original decision by the White House.

The **Pioneer-Continental Merger Case** has grown to include a CAB investigation of a possible Braniff-Continental merger and may expand further to consider merging Pioneer and one or more local carriers. Central Airlines has asked to enter the case.

RECENT CAB DECISIONS

• **American Airlines** not required to serve Nogales, Arizona, on its east-west route 4, following completion of Board-instituted investigation.

• **Japan Air Lines** issued a foreign air carrier permit for service between Tokyo and San Francisco via Wake Island and Honolulu, and between Tokyo and Okinawa.

• **National Airlines and Northwest Airlines** service mail rates lowered from 53¢ to 45¢ per ton-mile, effective January 1, 1954.

• **Air Traffic Conference** resolution proposing service charge of 20%, minimum $5, for "no-show" coach passengers, approved.

CAB CALENDAR

Feb. 1—Hearing in North American Airlines Enforcement Case. Tentative. Place and hour to be announced. Docket 6000.

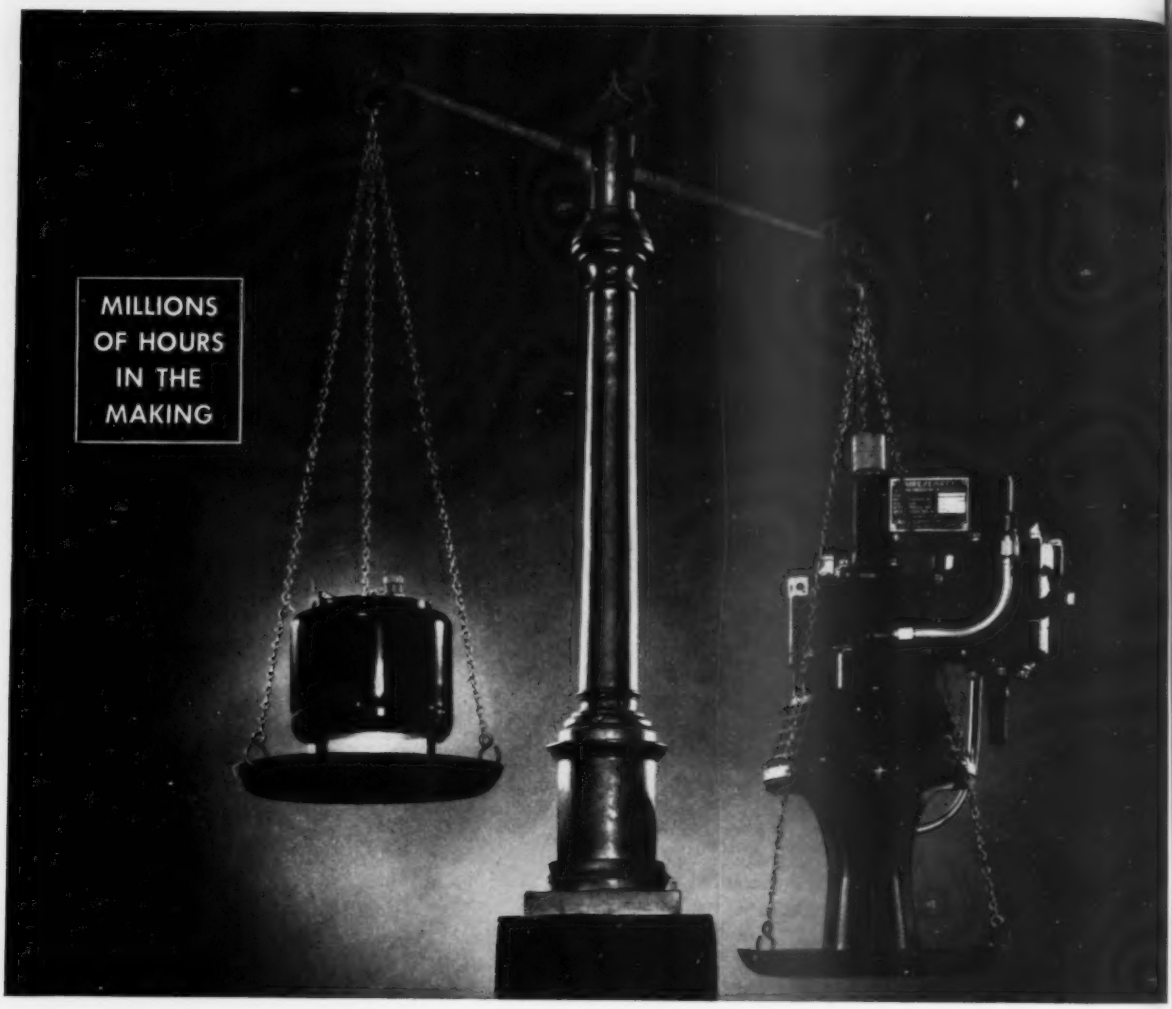
Feb. 1—Hearing in South Atlantic Renewal Case (Pan American World Airways). Washington, D. C. Docket 5818.

Feb. 9—Prehearing conference in Domestic All-Cargo Certificate Renewal Case. Washington, D. C. Docket 4770 et al.

Feb. 16—Hearing in Reopened Latin American Air Freight Case. Washington, D. C. Docket 2888 et al.

Feb. 23—Hearing in Northeast Airlines Provincetown Service Case. Washington, D. C. Docket 6204.

Mar. 15—Hearing in Certificate Renewal Case—Ellis Air Lines and Alaska Coastal Airlines. Tentative. Dockets 6264 & 6307.



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INTERNATIONAL AVIATION

Edited by Anthony Vandyk

INTERCOM

Interchange of aircraft between airlines is seen by many as the only workable method of getting year-round full utilization out of today's costly transports. Unfortunately U. S. certification regulations make this virtually impossible, since a foreign-owned aircraft operating for a U. S. carrier would have to have U. S. certification, even though most foreign governments would accept U. S.-owned planes flying their airlines' routes.

If certification regulations had permitted, Scandinavian Airlines System DC-6's and DC-6B's would have been operating into Miami on National Airlines' routes this winter. In return National planes would have flown the SAS trans-Atlantic route during the summer season. This interchange would have been ideal for both parties, since the slack period for one carrier coincides with the busy season for the other.

The International Civil Aviation Organization is making an effort to unravel the international red tape that does not encourage the interchange of aircraft within Europe. This subject is a major item on the agenda of a conference next April in Strasbourg aimed to improve commercial and technical cooperation between European airlines.

The Strasbourg meeting, which is being convened by ICAO at the request of the Council of Europe (the embryo European parliament) is not likely to have beneficial effects for U.S. carriers. In fact, PAA and TWA would suffer a heavy blow if a Dutch-backed plan on the interchange of routes is approved by the meeting.

This, according to ICAO, means "the operation by companies acting in collaboration, of a round-trip or circular service on a route or system of routes involving the territories of at least three states, each of the companies being authorized by the competent government authorities to exercise commercial rights pertaining to the route or system of routes." In less complicated phraseology, it would mean the first step toward restricting regional operations to the airlines of the nations in that region.

Canada Moves to Stabilize Industry

Canada has shaped a new military aircraft procurement program designed to meet almost all RCAF and naval aviation demands and to stabilize the Canadian aircraft industry for at least three years through a production stretchout (AMERICAN AVIATION, January 18).

The highlights of the program are:

• **A contract to A. V. Roe Canada Ltd.** to complete CF-105 twin-jet delta-wing interceptor design studies and build a prototype. Eventual production would get under way by 1958-59. The CF-105 would replace the RCAF's CF-100 Mark 4.

• **A Canadair Ltd.** contract to proceed with design study program and build a prototype of a modified version of Bristol Britannia as a maritime reconnaissance replacement for the RCAF's Lancasters.

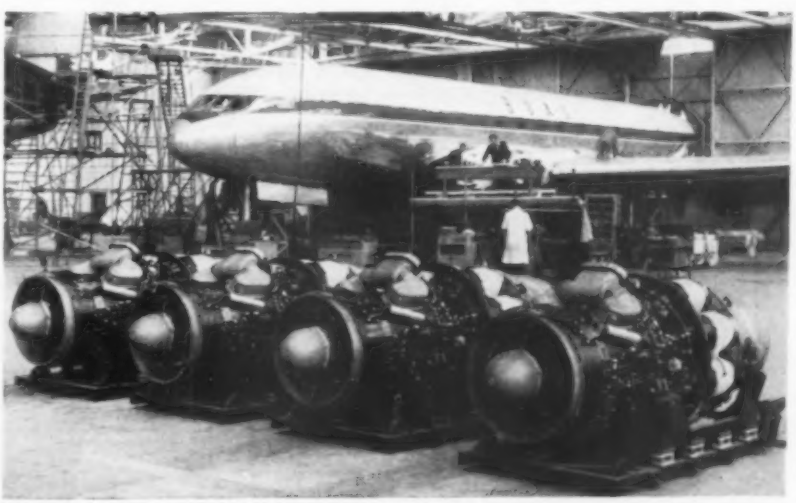
• **A de Havilland Aircraft of Canada** contract to build Grumman S2F sub-hunter and killer planes for the Canadian Navy.

• **Purchase of 30** McDonnell Banshee fighters for $10 million from the U. S. for the Canadian government.

• **Decision by the RCAF** to order 25 Lockheed P2V-7 patrol bombers to replace some of its Avro Lancasters pending availability of the Canadair-built Britannia. Deliveries will start in the fall and will be completed within 10 months. An additional order for 35 P2V-7's is possible.

The program is calculated to keep defense spending at a fairly stable level over the next few years. It is expected that air defense expenditure will hit the $4 billion mark by 1958. Half will go for aircraft, engines and spares, and half for ground installations (such as the Pine Tree radar project).

The RCAF's CF-105 project is to be integrated with U. S. polar defense planning to provide a supersonic, long-range, all-weather interceptor capable of stopping the sort of jet bomber it is estimated that the Soviet Union will have available by the late 1950's and the early 1960's.



Comet II is being modified by hand. Engines are Avons awaiting installation. The new leading edge on the Comet wing has brought a new problem with the Avon-engined Comet II: compressor sensitivity to uneven flow has necessitated air intake modification. The upper lip is being extended six inches and the lower edge is cut back the same distance. This has been necessitated by the higher incidence now possible for take-off and landing. The first three Comet II aircraft are being modified by hand, but future aircraft will incorporate production modifications. The Comet II production picture currently looked like this in early January: Hatfield—three on flight trials, 14 on the line; Chester—three on the line (first delivery after midsummer); and Belfast (Short's)—two on the line (first delivery late summer or early fall).

INTERNATIONAL AVIATION

MANUFACTURING

NETHERLANDS: First SAAB Scandia built by Fokker under license from Sweden's Svenska Aeroplan AB is scheduled to fly any time now. Six are being constructed—four for Brazilian airline VASP and two for SAS.

INDIA: Hindustan Aircraft Factory, Bangalor, has been given a U. S. CAA repair station certificate.

FRANCE: SIPA 300 light jet trainer is scheduled to fly in July. Powered by a 350-pound thrust Turbomeca Palas, it will gross 1850 pounds and will cruise at 200 mph.

BRITAIN: Production of Gloster Meteor jet fighters and trainers will end within 12 months, by which time well over 3000 will have been built.

A pressure refueling system is being fitted to latest British fighters. It will enable an aircraft to be refueled at 200 gallons a minute.

Flight Refueling Ltd. is equipping an English Electric Canberra as a tanker. Company is trying to interest the British government in a flight refueling scheme for the Valiant jet bomber.

Percival P.84 jet trainer is due to fly in April. Two of the Viper-powered planes should be available for the Farnborough show in September.

Fairey Gyrodyne with pressure-jet rotors has been making tie-down tests and will fly very soon. A 550-hp Alvis Leonides supplies compressed air to the rotors and drives two two-blade propellers mounted on stub wings.

First pre-production Gloster Javelin all-weather fighter has started its flight test program. It is the fourth Javelin built—two crashed.

Technical tie-up between Bristol and SNCA du Nord is being strengthened. French company is receiving advice on helicopter design and Durestos (asbestos phenolic) structural plastics.

MILITARY

INDIA: First two Fairchild C-119 transports for the Indian Air Force were due to be delivered last month. Deliveries of the 26 will start in September. Planes are being bought from the USAF under special arrangements not connected with MDAP.

First Indian commander of the Indian Air Force is Air Vice-Marshal S. Mukerjee who replaces RAF Air Marshal G. E. Gibbs.

BRITAIN: Royal Navy's first carrier with angled flight deck and steam catapults will be the light fleet carrier Centaur, which is due to be commissioned in June or July.

RAF interest in the Handley Page Victor jet bomber is strengthening. The plane is showing up well in service trials and the initial order for 10 may be increased.

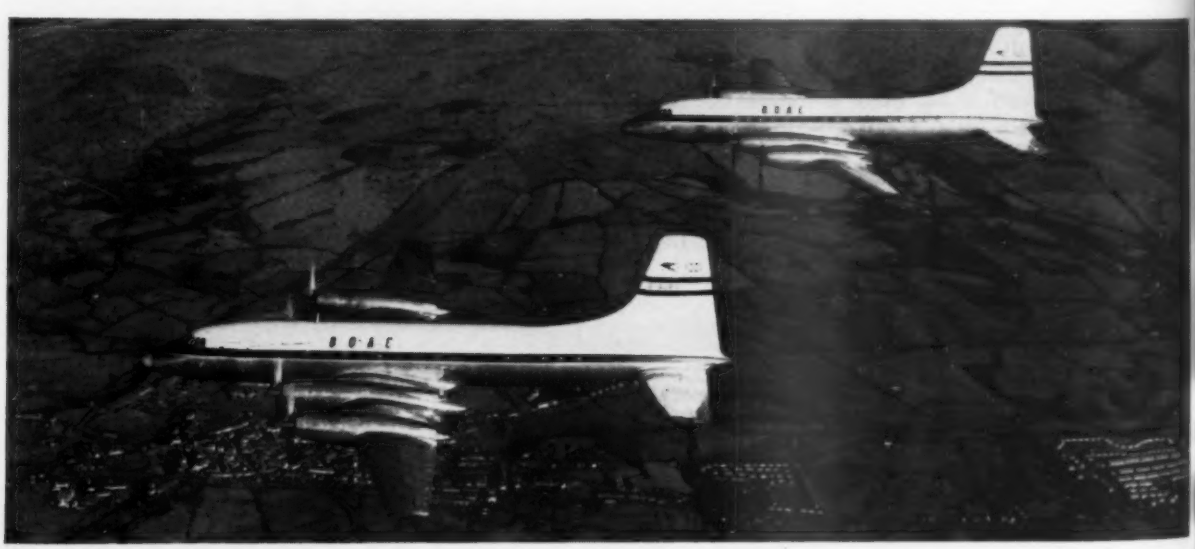
NETHERLANDS: Dutch Air Force now has twice as many pilots as planes and has stopped sending personnel to the U. S. for flying training. All training is now carried out in the Netherlands.

AIRLINES

BELGIUM: SABENA and British European Airways have agreed to operate the Brussels-London route in pool effective April. Belgian carrier has switched its order for two DC-6A aircraft to two DC-6C's.

BRITAIN: BOAC plans to start service from London to Chicago in the spring with first-class Stratocruiser flights.

Airwork Ltd., independent operator, has applied for permission to operate a coach service between London and Hong Kong. Carrier recently sold two DC-3's to Air Vietnam.



Second Bristol Britannia started its flight trials on December 23. BOAC has ordered 33 and holds option on two more.

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Release Specifications For Air Tractor

The Air Tractor prototype, specially designed dusting and spraying biplane, is undergoing accelerated flight tests by the Central-Lamson Corp. of Yakima, Wash.

Preliminary specifications based on tests show that the 450 horsepower P&W Wasp Jr. engine aircraft can carry spray loads of 2500 pounds at an altitude of 1070 feet. Plane takes off in less than 1000 feet and climbs at 450 feet per minute for 2000 feet after take-off. Aircraft lands with full load in 950 feet.

Airline Lift Capacity Up 42% in Three Years

Lift capacity of U.S. domestic and international scheduled carriers' aircraft has increased 42% while fleet size has risen 17%, according to CAA statistics based on reports filed by the airlines with CAA and CAB for the past three years.

U.S. carriers were operating 1336 aircraft as of June 30, compared to 1142 at the same 1950 date.

Domestic trunks used a greater percentage of ton-miles available in 1953 than 1950. In 1953 revenue use totaled 1542 million ton-miles out of the 2629 million ton-miles available, or 58.67% compared to 53.59% in 1950.

Local service carriers went from 31.11% to 36.95%; international from 55.45% to 60.67%; and all-cargo from 69.33% to 80.44%.

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WAYNE W. PARRISH

Ginger & Crowd. There being nothing modest about me, the story about those Arab dancing girls in the Sahara will have to wait awhile to make room at the bottom of this page for a little self-aggrandizement. After all, when an aging old duffer like me gets an award, everything else can stop.

Meantime let's continue with that Air France Golden Parisian inaugural to Paris which took place last November. On board were such celebrities, so they say, as **Ginger Rogers** and her new French husband; **Jinx Falkenburg**; **John Cameron Swayze**, the Camel Caravan TV news commentator; **Frank Parker**, the singer; **Jerome Zerbe**, the fashion-plate photographer and dilettante; and **Margaret Bourke-White**, the female photographer.

Any one of these, except for Swayze, who's a really grand unaffected guy, would be the last to deny that he or she is a celebrity. But Air France wanted some big names, and got 'em. I must admit, however, that fortyish Ginger Rogers is remarkably well preserved and doesn't look as much older than her young husband as their actual ages would indicate.

Poor Talbert. I found some good aviation writing friends on board, good guys like **Bob Mountsier**, and **Bob Sibley** of the *Boston Traveler* and **Art Riley** of the *Boston Globe* (with his 87¢ Boston-bought French beret) and **Ed Talbert** of *The New York Herald Tribune*, who had the misfortune to be my bunkmate in one of those ducky Skyrooms. Both Talbert and I will resent formal any inferences drawn from our sharing of this honeymooners' dream boat. W both love our wives. (Ed's got a pa pip.) We both behaved like gentlemen At least I think so. Anyway, neithe had anything to do with the choice bunkmates.

There's one thing about a Super Constellation, it has terrific range. An with only 32 passengers aboard, it wa a cinch to fly nonstop to Paris. The time was about 12½ hours. Mighty nice to fly direct without the traditional Gander stop.

Paris had had terrible weather, but it broke enough for our flight to get through. November is the worst month for flying weather in Europe, and I was somewhat astonished that Air France would have the courage to try to have a press flight at that time. It was grey and cold and damp.

Hotel Baggage. Since we were late arriving, having departed late from Idlewild, I grabbed my bag and got into town to the George V fast, since I had some friends waiting and some business to accomplish. But brother, try and get a big European hotel to handle luggage fast. Despite my early arrival in town, accompanied by my bag, it took almost an hour to get it to my room. Man **Blouet** runs a fine hotel, but he could sure improve the baggage service.

I was sure annoyed at the George V because I had a lot to do in a short time and one of these days I might tell you about it. I bought a car, and what a car. But that's for later.

THAT CHUBBY DOUBLE-CHIN CONTENTED HOTSHOT with the good, pure wholesome life fairly oozing out of him which you see pictured above, meaning me, got quite a surprise in Phoenix, Arizona, on January 10 when I was awarded top honors in TWA's 16th annual aviation writing and picture competition. And it was *really* a surprise because I hadn't entered anything and didn't realize you don't have to submit something to win this particular award.

That's Governor Howard Pyle of Arizona presenting the Strebig-Dobben Memorial Award which goes each year, so it says here, "to the writer or editor who has done most for aviation during the past year." It is quite doubtful that I merited such distinction, but the $250 check which goes with the honors was much appreciated and was contributed immediately to my favorite charity and you don't have to guess hard which one that is. That's Gordon Gilmore, TWA v.p.-PR, at right.

Just to show that airline sales promotion guys have imaginations second to none, the other photo shows Don Hunter, TWA's sales promotion manager for Los Angeles, fitting on my tubby frame a levi Tuxedo especially tailored for Yours Truly by Levi Strauss & Company. It's said to be the only Levi Tuxedo in existence except for one made for Bing Crosby. Hunter neglected to tell me what I do with it now that I've got it. All of this took place at Paradise Inn, one of the many fine resort hotels outside Phoenix, during the "Quickie Vacation" trip tied in with TWA's writing competition. I was put up at the Camelback Inn, which I can recommend as one of America's finest resort hostelries. That Phoenix area turned out to be quite a place in more ways than one. I'll be back.

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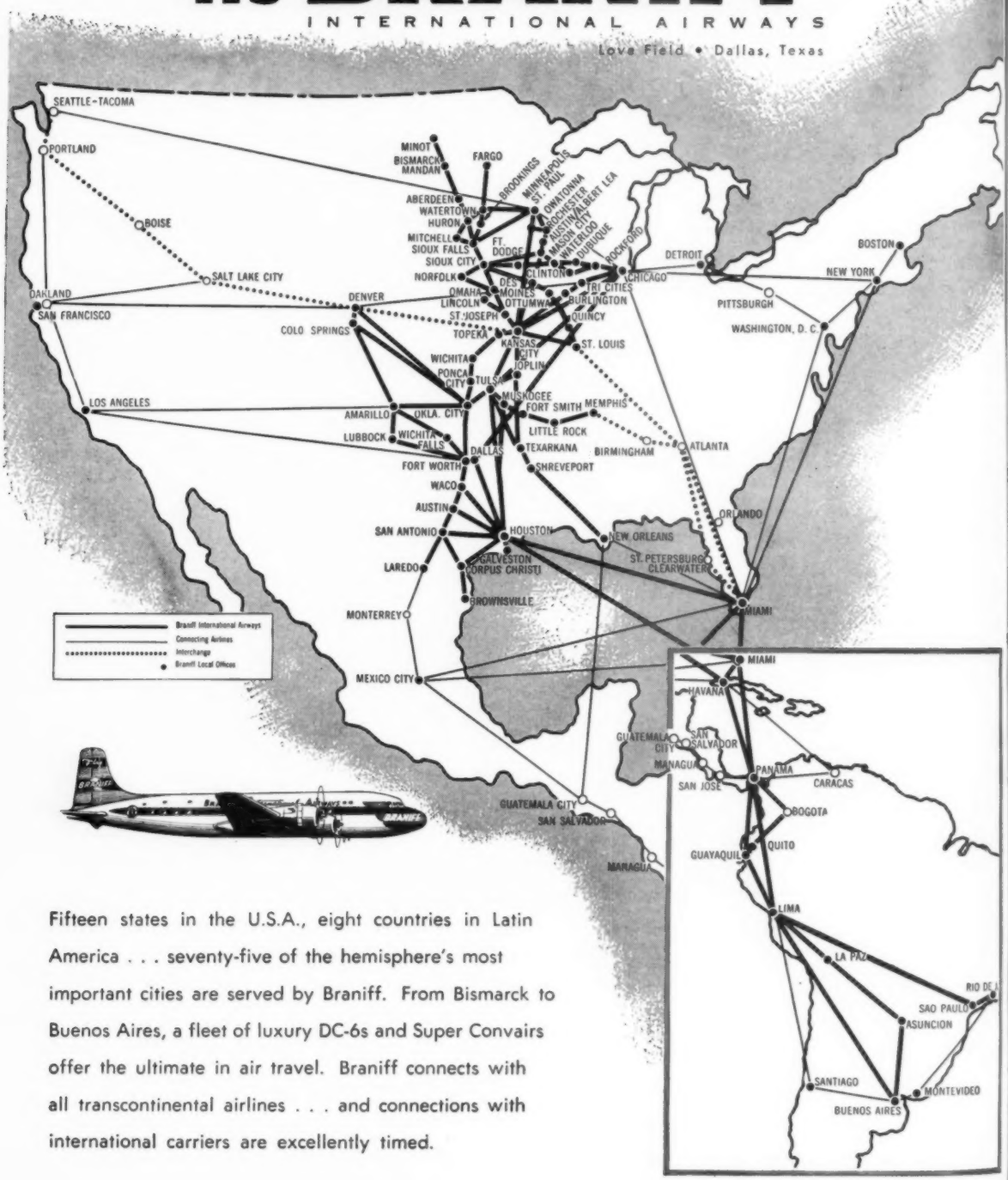

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News at Deadline

Douglas, Lockheed See Bright 1954 Outlook

"Over the next two or three years, at least, it is to be expected that the present level of business will be maintained," Arthur E. Raymond, vice president of engineering for the Douglas Aircraft Co., told the Business Outlook Conference in Los Angeles.

In a similar review of prospects for the future, Lockheed's vice president Burt C. Monesmith predicted that "California division production and sales during 1954 will come close to equaling those of 1953, which have been at the highest rates since World War II."

Sales figures from both firms lent weight to the optimistic tone of the predictions. A preliminary 1954 audit up to the end of the fiscal year on November 30 at Douglas indicated that sales had hit a peacetime high of $875 million. The figure for the previous fiscal year had been only $523 million. Earnings were reported up from $8.99 per share to $15.50. Backlog on December 31 was set at $2.21 billion.

At Lockheed the California division entered 1954 with a backlog of over $800 million. Monesmith revealed that the firm had just received a large order for more military versions of the Super Constellation, extending work on it into 1956.

One-Year 'Copter Exemption for NAL

The CAB has granted National Airlines a one-year exemption to conduct helicopter services within a 150-mile radius of Miami. It is the first helicopter authorization granted by the Board to a trunk line and stemmed chiefly from National's offer to experiment with the service free of subsidy.

Previously the Board had granted experimental certificates for helicopter operations in Los Angeles, Chicago, and New York, but to companies not otherwise engaged in air transportation.

The Board's action in the National case is not, at this point, considered a switch in policy, but is indicative of the thinking that other types of helicopter experiments may be justified, particularly when there is no added cost to the Government.

The award to National becomes effective February 1, 1954. Carrier will conduct the service with a Sikorsky Model S-55 helicopter which it owns. Two additional S-55's have also been contracted for by National, with service in other regions, particularly the Norfolk area, distinct possibilities.

AA Exempted to Fly Non-Stop NY-Mexico

American Airlines has been granted a temporary exemption by the CAB which will permit it to fly non-stop from New York to Mexico City. Flights had previously been required to stop at Dallas/Ft. Worth. The move was made to allow the carrier to compete with Air France, which scheduled operation of such a service starting January 26.

Chairman Gurney, Vice Chairman Denny, and Member Ryan formed the majority in the voting; Members Lee and Adams dissented. The majority stated that it was not predetermining the final pattern for such service, and that the action was without prejudice to applications now on file or that may be filed.

Adams said in his dissent: "I cannot subscribe to such precipitate action, cutting across all procedural rules of this Board. . . . The carrier's application was filed . . . at 8:52 a. m. . . . The Board convened eight minutes later and approved American's request . . . by a vote of 3 to 2 and adjourned at 9:40 a. m."

A court action filed by Eastern Air Lines resulted in agreement by CAB that non-stop authority granted American Airlines for New York-Mexico City service would not become effective until February 8. Eastern asked the U. S. Court of Appeals, Washington, D. C., for a stay of the non-stop authority and judicial review. Court scheduled hearings on the stay petition February 4.

Denny Appointment Approved by Senate

The Senate has confirmed CAB Member Harmar D. Denny for reappointment to a new six year term of office expiring December 31, 1959. Denny's nomination was unanimously approved by the Senate Commerce Committee on January 19, the day after he had appeared before the Committee in his own behalf.

Military Will Finance Ocean Weather Ships

The military services will take over the support of North Atlantic ocean weather stations on a reduced scale, making it possible for the U.S. to support the program at an ICAO meeting this month in Paris.

President Eisenhower, in his budget message, announced "The fact that our transoceanic civil aviation no longer has a requirement for ocean weather stations has made it possible to reduce the number of these stations to those required by the Department of Defense, which in the future will finance them."

Navy Ends Tests in Trainer Competition

Navy trainer competition tests have now been completed at Pensacola. Winner will be announced within the next few weeks.

Three designs were tested: Ryan, side-by-side seating; Temco, 2500-pound tandem; and Beech, 3000-pound tandem.

P. O. Asks Reversal Of CAB Ruling

The Post Office Department has asked the CAB to reverse a decision made in December in which certificated all-cargo carriers were denied exemptions to participate in surface-mail-by-air experiments. Slick, Flying Tigers, and Riddle bid to carry first-class mail over their entire systems at 18.66¢ per ton-mile. The P. O. urged approval either on a system-wide basis or on routes on which scheduled lines are not experimenting in the first-class mail field.

NEA Buys Four Convairs

Four Convair 240's have been bought by Northeast Airlines from the Latin American Division of Pan American World Airways. The purchase doubles the NEA Convair fleet. NEA plans to put the aircraft into service in early spring.

J73 Tried in F-84F

Tests of the G-E J73 engine in the Republic Aviation F-84F have been started at Farmingdale, N. Y. Pending results of the tests, F-84F production will continue with the Wright J65 engine now being used.

BOAC Resumes Comet Training Flights

BOAC has resumed Comet training flights but there is no indication when scheduled services are to be reinstated. Meanwhile, transport minister A. T. Lennox-Boyd has told the House of Commons that sabotage was a no more likely cause of the Comet crash on January 10 than a number of other possible causes.

Every effort is being made to locate and salvage the sunken wreckage, but this may be a lengthy and difficult process. Fishermen have found and salvaged a large section of the tail.

Meanwhile, the first production Comet II, due to be delivered to BOAC in the spring, has begun tropical tests in the Sudan. This will represent the last stage in the model's certification test program.

AF Academy Bill Passes the House

The proposed Air Force academy, AF officer training site comparable to West Point and Annapolis, has been approved in a House bill by a roll call vote of 328 to 36, the first major House legislation passed this year.

The measure, H.R. 5337, which now goes to the Senate, would authorize an initial outlay of $26,000,000. The House Armed Services Committee had earlier approved the bill for the project at an estimated overall cost of $175,000,000. Selection of a site for the academy has not been announced.

North American Aviation Wins Name Case

North American Aviation, Inc., has succeeded in its efforts to obtain a court ruling to the effect that the North American Airlines combination will no longer be allowed to use that name. U.S. Judge Peirson M. Hall, in Federal Court in Los Angeles, announced that an injunction would be issued against the non-scheduled carrier group.

The judge ruled that the evidence was overwhelming that the irregular group's use of the name was deliberate and calculated and intended to capitalize on the good name of the manufacturing firm, now in its 25th year.

A recent CAB ruling, now being appealed, held that use of the word "American" in the carrier's name infringed on American Airlines. In the first nine months of 1953, North American Airlines spent $1.9 million in advertising.

Transportation Council Weighs Airport Study

The General Transportation Council of the Department of Commerce has turned over to a special committee the industry study report on Federal aid to airports. Under Secretary of Commerce Robert B. Murray has asked that the council's findings on the report reach him by about February 1.

A fiscal 1953 report on expenditures for the Federal aid to airports program shows that CAA spent $26,990,836 during the period, for a total expenditure since 1947 of $158,909,720.

Of the $14.3 million in new money appropriated for the fiscal year, $11.8 million was available for project allocations. CAA added 151 projects at 41 locations not previously programmed. Actual dollar value programmed was $10,417,711.

A total of 213 projects were included in grant agreements for the year, representing commitments of $13.2 million in Federal funds. Fiscal changes affecting prior year grant agreements decreased previous obligations by $1.8 million for a net increase of $11 million in obligations. Twelve projects, which would have totaled $378,599, were dropped.

Four hundred and three projects were completed. Final payments were made on 379 projects at 154 locations, representing Federal obligations of $37,136,100 and $23,682,948, respectively.

Backlog of 2235 airports requesting aid remained at the end of the year.

CAB Proposes Agenda For Annual CAR Review

The Civil Aeronautics Board has proposed discussion of airworthiness rules for jet transports at its 1954 Airworthiness Review. In planning the fall meeting, the Board suggests talks on changes to CAR Part 4b which would make it "more realistic" for turbine-powered aircraft.

Other agenda items under consideration are: further revision to Part 1 on certification of aircraft and related parts; studies of new performance requirements for T-category aircraft; helicopter transport category proposals; performance provisions in rules governing air carrier operations; and replacement of CAR Part 16 with the Technical Standard Order system in approval of radio equipment.

Comments or other suggestions from industry on the agenda will be received by CAB until March 1.

Johnson to Head ATA

Earl D. Johnson on February assumes the presidency of the Transport Association, succeeding miral Emory S. Land.

ACC Group to Review Common Syste

Air Coordinating Committee set up a special working group of hig level civil and government specialis to review the "Common System" air navigation. The group is headed Capt. A. J. DeJoy, U. S. Coast Guar and is organized under ACC's Traffic Control & Navigation Panel.

Purpose of the study at this tim is to review the principles, policies, pro cedures, equipment, objectives, an stages of implementation of the so called transition phase of the "Comm System." This phase was defined ACC's report "Air Traffic Control an the National Security" in Decembe 1950.

Government membership on th committee will include Army, Navy Air Force, Coast Guard, CAA, CAB and Air Navigation Developme Board representatives. Civil organiza tions represented are: Aircraft Owner & Pilots Association, Air Line Pilot Association, Air Transport Association Aircoach Transport Association, Airpor Operators Council, National Busines Aircraft Association, and National Asso ciation of State Aviation Officials.

AF Measures Engine Life Expectancy

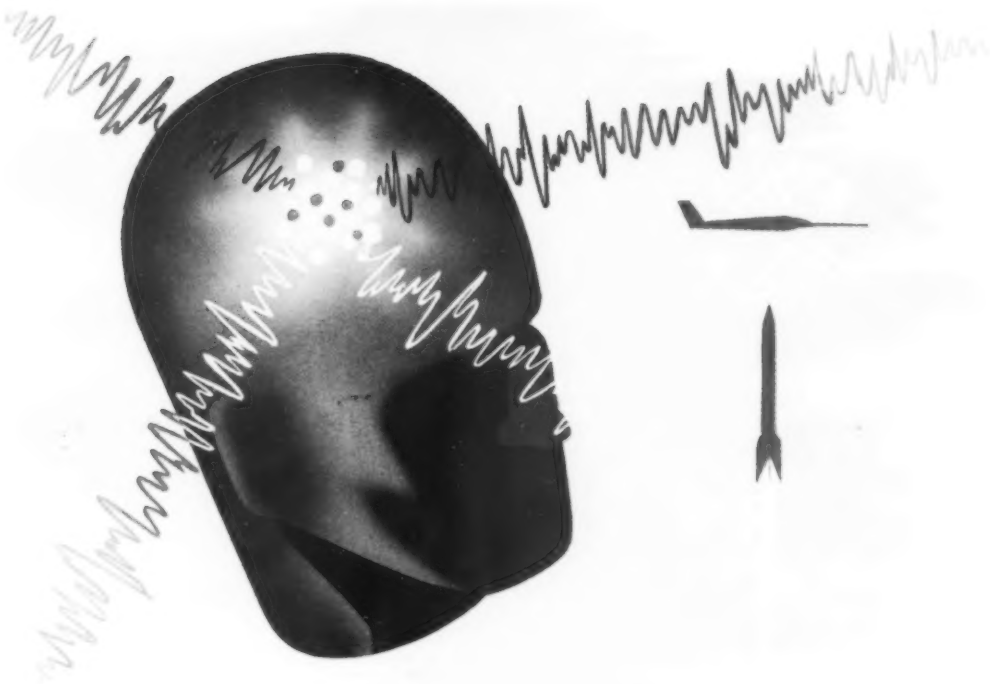
The Air Force has undertaken a special study to determine the life ex pectancy of all of its first-line aircraft engines.

Actuarial tables have been worke out for 12 powerplants to date: Allison J71, J35, and J33; General Electric J73 and J47; Curtiss-Wright J65; and Pratt & Whitney J57. Reciprocating types in clude the Pratt & Whitney R-4360 and Wright R-3350, R-1820, and R-1300.

A Continental R-975, for converti plane and helicopter use, is undergoing similar study.

Hawkins Heads Lockheed Missile Division

Willis M. Hawkins has been ap pointed chief engineer of Lockheed Aircraft's new Missile Systems Divi sion. Headquarters of the division will be transferred from Burbank to the firm's Van Nuys, Calif., plant. Move should be completed by July 1.



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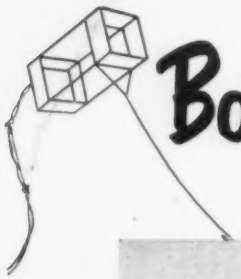
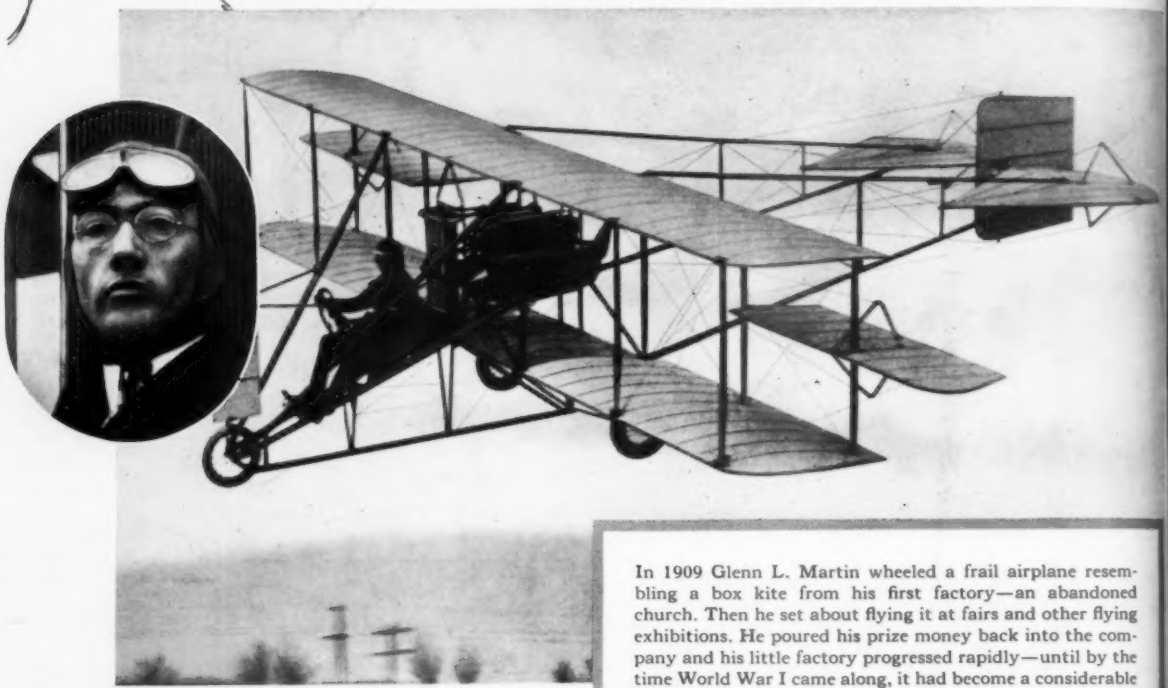


Box Kites to Pilotless Bombers-

1909-1954



In 1909 Glenn L. Martin wheeled a frail airplane resembling a box kite from his first factory—an abandoned church. Then he set about flying it at fairs and other flying exhibitions. He poured his prize money back into the company and his little factory progressed rapidly—until by the time World War I came along, it had become a considerable enterprise and was well on its way toward becoming the mighty manufacturing unit it is today.

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